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November 1987

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THE COLOR COMPUTER MONTHLY MAGAZINE

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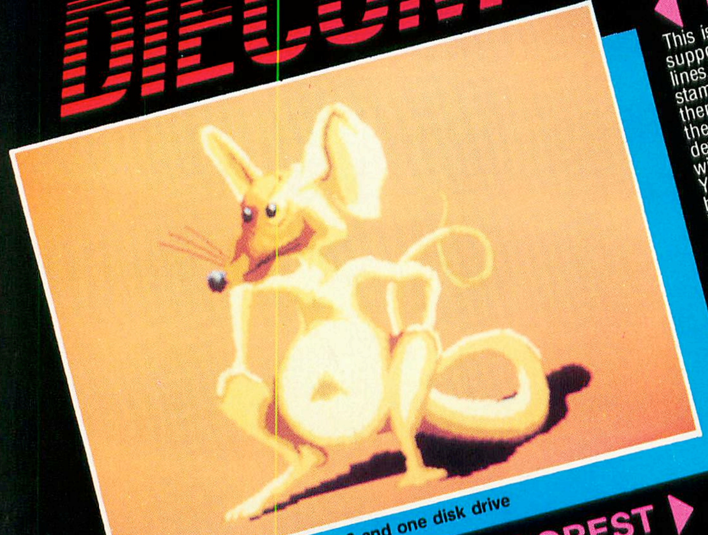

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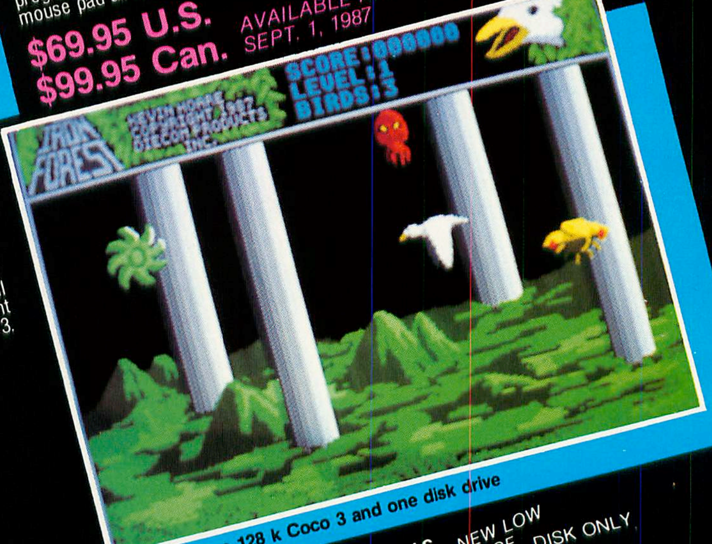

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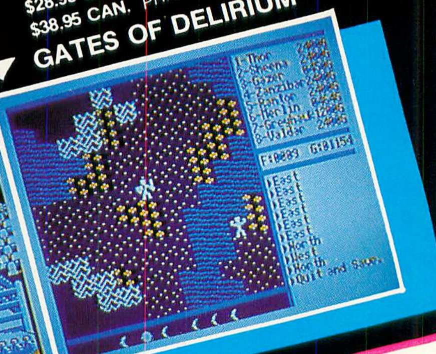

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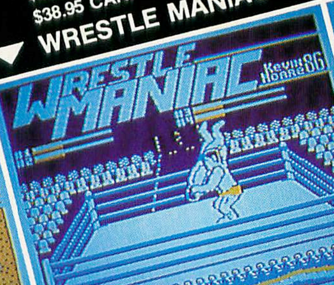

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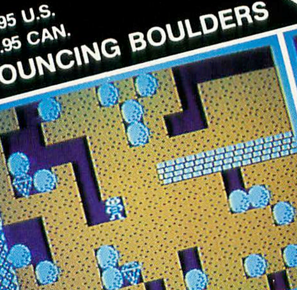

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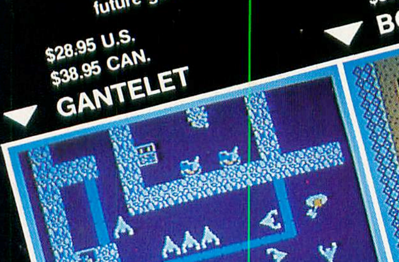

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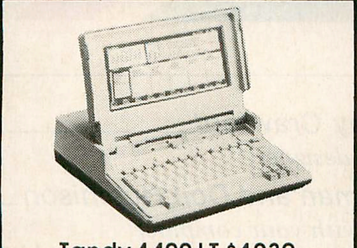

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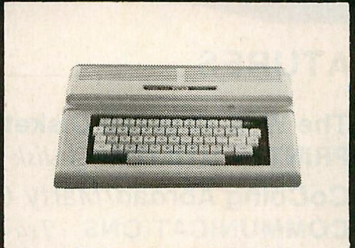

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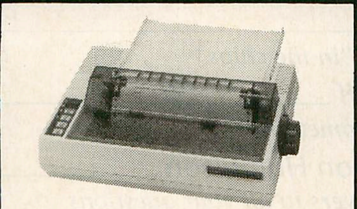

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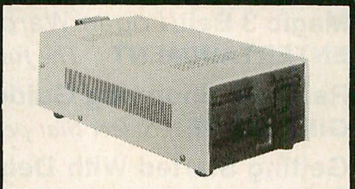

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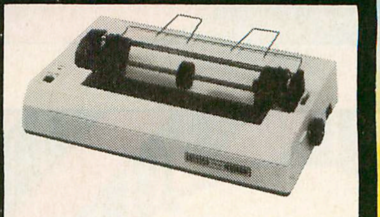

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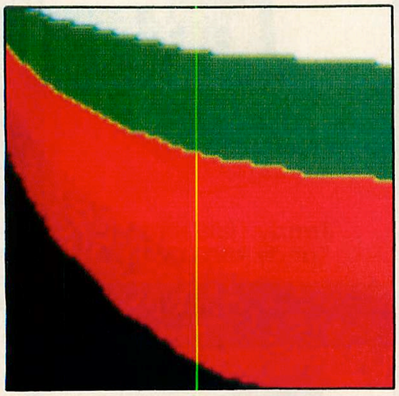
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**NEXT MONTH:** Grab some holiday cheer and follow THE RAINBOW to the North Pole! "Do You Hear What I Hear?" If it's not sleigh bells, it must be a four-voice rendition of that carol and a medley of others. Wake up from "A Christmas Dream," an Adventure where you find the presents left on Christmas morning. Use our Christmas filer to keep track of your holiday cards. Look for these plus a wide selection of games, utilities, Q-and-A columns, hints, tips and lots more all for your CoCo 1, 2 and 3. Happy Holidays!

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The RAINBOW
November 1987 Vol. VII No. 4

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## Letters to the RAINBOW

# Serial Solution

*Editor:*

I recently purchased a program on a protected disk. I'm not an expert on disk quality, but it appears to be a cheap, flimsy disk. This means that if I'm in the middle of a project using that program and that disk goes bad, I'm out of luck.

I realize that unauthorized copies are a problem for software dealers. However, when they sell me a program that will let me down some day, they are making their problem my problem. When I buy a program I want a product that is, and will continue to be, dependable — more dependable than a cheap, flimsy disk.

It seems to me that a better solution to the unauthorized copies would be to embed a serial number in the program on each authorized copy. Then, at some point, register that serial number with the person responsible for the proper and legal use of that copy. This, in effect would put the purchaser's name on the program and on any unauthorized copies. I think that people would be more reluctant to give out illegal copies if those copies could be traced back to them.

I realize that this would complicate the distribution process. There would have to be some way to re-register the owner of the program as it changed hands in a legal manner. However, I think that this would be preferable to selling people programs which will eventually let them down.

*Loren Grage*
*Phoenix, AZ*

### BACK TALK

*Editor:*

I have had some serious frustration trying to get OS-9 to work for me. I have a CoCo 3 and OS-9 Level II, and for everything I try to do I have to fight and wrestle to get this beast in line. For my living, I work on a VAX under UNIX System 5, so I would like to come home and pop OS-9 in the computer and take off from there, but every program I get, every tip I follow, involves several hours of work just to get one little nugget of useful utility.

For example, in your May 1987 issue in "KISSable OS-9," Dale Puckett tells how to get *DeskMate* to run the printer at 2400 baud. After three hours of hair-pulling trying to figure out why I kept getting `ERROR - BOOT FILE FRAGMENTATION` I just had to quit. Finally, I figured out my problem: Mr. Puckett didn't mention that I should boot up *DeskMate* and close down the program from the main menu so that my boot file would be the one loaded before I attempt the patch he offers.

While something like that may seem obvious to some people, it caused me 24 hours of teeth-gnashing. Don't get me wrong, I am grateful for the tips and advice Mr. Puckett includes in his column. I never have understood why Tandy never thought ahead to the fact that users may want to print things a little faster than 600 baud. As for proof that his advice was helpful, I am printing this letter at 2400 baud. Yee-ha!

*Michael D. King*
*Powell, OH*

### REQUEST HOTLINE

*Editor:*

I have been a subscriber to your wonderful magazine for five years now and eagerly await each edition. However, I have a complaint regarding the direction the format of the magazine has been taking the past year or so.

In the earlier days, in practically every issue, there would be a program or two that was useful, such as home accounting, inventory, amortization, figuring home construction projects, etc. There was even one on what kind of fishing lures to use on given days (it works, too). Now it seems that every issue is devoted almost entirely to games. While I realize there is a great demand for this kind of programming among the younger folks, there's enough of us "old goats" around who couldn't care less how to shoot down a spaceship loaded with Purple People Eaters.

How about getting back to putting at least one program (doesn't have to be elaborate, just practical) in each issue for our interest. As Jutta Kapfhammer is taking over as managing editor, I'm sure she will be looking for ways to improve THE RAINBOW, and I respectfully submit this suggestion for her consideration.

*Charles E. Pauley*
*Orange, TX*

### Upgrade Downgrade

*Editor:*

I give up! The whole idea of the new CoCo was to get better graphics, more speed, a better command set and more memory. But, alas, the memory upgrade issue has turned into a used car lot atmosphere, complete with a whole slew of consumer advocates giving us hints here and there.

I would appreciate a little wheat being separated from the chaff! Comprehensive articles detailing some basic aspects would seem timely.

As a starting point: Are contacts gold plated? Are the chips in the upgrade all socketed? Are the new chips on top or bottom? What is included in the price? The warranty period? The type of warranty?

I hope you give this idea some serious thought. Farming out these upgrades one at a time to your reviewers won't give us this type of comparison. Keep up the good work.

*Greg Clark*
*Syracuse, NY*

### 3-Column Listings?

*Editor:*

As soon as I read September's "Building A Rainbow," I thought I would send in my comments.

When I read ". . .Would three-column listings be OK . . ." and ". . . should listings be eliminated . . ." several responses went through my mind. In regard to the three-column listings, the obvious objection would be the size of print. There are many of the older generation who have found a wonderful hobby becoming a CoCoist. I find it most convenient for debugging, having the listings match what's on the screen. Would we still be able to read the print? I also think you should consider "entropy." If you stuff everything into one issue (an exaggerated example), what would you do for next month's issue, or next year's? Also, look at the ratio of RAINBOW ON DISK/TAPE users to that of magazine subscribers. This should indicate how many people still type programs by hand.

I honestly don't feel that a better, more balanced, well-rounded publication could be prayed for. It has grown from infancy to an adult of high stature worthy of praise. For a monthly magazine to remain in print for so many years, and to seed such a following is no easy task. To suddenly sever a limb, just to try on a new one, may cause an unrebounding shock. Continue to mature, yes! But it should be a natural growth, not a forceful one. Much could be left behind if the leaps are too huge.

In closing, all I can add is: "Hip-Hip-

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Hoorah" for the RAINBOW; "Hip-Hip-Hoorah" for Falsoft, Inc.; "Hip-Hip-Hoorah" for the CoCo Community.

*James K. Knight*
*Marysville, WA*

*Those of you who do type in the programs appearing in THE RAINBOW should refer to the three-column format of the listings beginning on pages 83 and 154. By printing them this way, we have saved approximately 15 magazine pages that are filled with additional material.*

*Two different versions of the three-column format are shown (one with lines between the columns and the other without). Please do send us your comments regarding this "on trial basis" format.*

### The Scholastic Challenge

*Editor:*

I think that you have an excellent magazine and support one of the best computers on the market. I have been a reader for two and a half years and have never seen a magazine that compares with it, for any computer!

Now that the compliments are over, there are a few things that I think would improve THE RAINBOW. I feel that the programs published aren't always the best possible. I am a college student, and have only so much time for typing in programs. Utilities are what I like the most. The games make the magazine fun, but what I think would be best are games that have interesting programming aspects (preferably short). But I would like to know more about the CoCo, and articles about our favorite computer are always read. It's been said that OS-9 is the future of the CoCo, and Tandy has ensured that with the CoCo 3. It would be nice to have more articles and programs and columns about this operating system. More articles and programs for the CoCo 3 would be great, too.

*Ron Nelson*
*Beaver Bay, MI*

### Bugs, Fixes 'n' Patches

*Editor:*

First and foremost, you absolutely, positively must have a "Bugs, Patches and Fixes" column! It's useful to know of a problem in both Radio Shack and third-party software, as well as possible solutions if they exist. Often I only find a bug in a paid-for application program after it has done its damage, and I have no idea how to cure it. I often read of fixes posted on Delphi, but it might as well be on Mars for me. I, as well as others, have no possible way of reaching Delphi, due to a number of reasons.

Furthermore, what is published in RAINBOW is randomly scattered in two consultation columns and one OS-9 column. A few fixes can be hidden in those elusive gray boxes filling up corners of pages. I've even found hints written in the column you now write! Surely this can be pooled into one column. That way only one place need be searched in each issue. Right now I must go through the entire magazine, and when looking through three years of back issues for help . . . you can imagine the time used up. So please consider a separate column for "Bugs, Fixes and Patches"!

My second suggestion is for an article on hard disks. I have noticed increased interest in them since OS-9 Level II came out. I have also seen an increase in confusion. An excellent example of the type of article needed is Marty Goodman's article in the August 1987 issue of RAINBOW on RGB advantages of each, and what to use them for. An article geared the same way for hard disks is desperately needed.

Some explanation should accompany the article as well — such things as the difference between SCSI and SASI interfaces, and how one can assemble a hard disk system from component boards as an alternative to getting a complete system all at once.

This brings to mind my third suggestion. Every May you have an issue devoted strictly to printers. Why not expand this to peripherals in general? Certainly many fancy things can be done with floppy and hard disks as well. Then there are those unique I/O devices that could have an article describing their use and benefit. These include music keyboards, voice synthesizers, video digitizers, EPROM burners, real-time clocks, RS-232C cartridges, programmable sound generators, motor controllers, and so forth. Printers are great, but many other peripherals can do just as fancy footwork. So how about a Peripherals Issue? Sounds good to me, and probably to many others.

My fourth and last suggestion is with OS-9. For some time Joseph Kolar has helped beginners with the Radio Shack/Microsoft BASIC in the Color Computer. Now I'm far from being a beginner; I belong on the other end of the scale. And yet it would be useful for someone, maybe Joseph Kolar, to concentrate on a bit of BASIC09 each month. The stuff in Level II can swamp a new arrival. Even though I've worked with UNIX for years, it takes a while to get through that 1,000-page plus binder from Tandy. There's enough to keep someone busy for years exploring the possibilities. Now Falsoft has taken a step in the right direction with its books, but there are books on BASIC, too. Yet you very considerately publish a column to help beginners. Windows and BASIC09 is where the future is. It needs attention as well.

*Brian D. Armstrong*
*Sunspot, NM*

### Tyrannosaurible OS-9

*Editor:*

There are lots of things that THE RAINBOW could do to help us all out. I have a 9-month-old CoCo 3 that has 512K of memory, which can't really be used.

For example, I'd love to use Ankia's *FFT* program and store the data in memory rather than on disk, but there's no way to store real numbers in that extra memory. I've used the Radio Shack C Compiler and think it produces good programs with graphics. But OS-9 is a dinosaur; the disk grinds on and on, and the intermediate code very often exceeds the disk space available to it. One wishes you could simply load the compiler and all of the intermediate and final code into memory rather than putting it on disk.

I'm sure you have lots of neat BASIC programs in your files. But, lately, when I want to produce PASCAL or C code, I do it on the IBM in *Turbo* or even Microsoft. If the CoCo is to survive, then it's got to do things as easily as the PC.

*Karl J. Casper*
*Cleveland, OH*

### Suggestion: Puzzles

*Editor:*

I am very happy with THE RAINBOW, which is the best magazine I have ever read. I am pleased with your articles, being most informative and interesting and also am very thankful for the good programs you publish each month.

What happened to Jim Reed's Comic-CoCo-Pet, CoCo Cat? Why is CoCo Cat not being published any more? I always read the CoCo Cat when I received my issues and now I miss it!

I have been thinking these days that THE RAINBOW should have some pages with entertaining puzzles. For example crosswords, word search puzzles and maybe also short CoCo detective stories for readers to find the murderer or thief. I have also noticed that you stopped with the Crossword Creator Contest. So, how about printing a couple of pages each month, maybe called "The Entertainment Section."

*Werner Daniel Streidt*
*Cairo, Egypt*

*CoCo Cat will return next month.*

### INFORMATION PLEASE

*Editor:*

I own a 64K CoCo 1 with Disk BASIC. Does anyone know where I can get a host program for the CoCo? I use my computer for business applications and require that my partner be able to access and run my business programs via his own computer. If anyone has any information that would help, please write to me.

*Alex Kouvaras*
*203 Moray Street*
*New Farm, QLD 4005*
*Australia*

Remote2, *a host program, appeared on Page 106 of the November 1985 issue. Because two of the telecommunications programs printed this month require* Remote2 *for operation, it will also be included on this month's RAINBOW ON TAPE and RAINBOW ON DISK.*

### BBS Start-Up

*Editor:*

I have a 64K CoCo 2, two drives, Multi-Pak, DCM3 modem, and a DMP-110 printer. I am interested in starting up my own BBS. What software is available for me to do this? I also have an old Model III, 16K TRS-80, which could be upgraded. I would like to use it as a BBS; what software is available for it? I am looking for an older "silver" CoCo 1, upgraded or not.

*Chauncey A. Bailey*
*1107 Clingan Ridge Dr.*
*Cleveland, TN 37311*

*You might refer to the November 1985 through February 1986 issues of RAINBOW for a series of articles detailing the* CoBBS *system. Also, see Page 152 of this issue for an easy-to-use BBS program.*

### Simple Division

*Editor:*

I have *Color Profile*, which I've been using extensively for the past few years, and I'm in need of some assistance/advice.

Until recently I've had only one disk drive and consequently had to keep both my control and data files on one disk. Now that I have two drives I'd like to separate those control and data files to make my control files more useful and add storage space to my data files. How do I accomplish this?

*Paul Vasko*
*820 Ambassador Loop*
*Tampa, FL 33613-2107*

### Requisitions Requisitioned

*Editor:*

Is there a machine language program to help fill out forms and/or requisitions? I have all kinds of invoices and requisitions to fill every day, and I need a program that would create forms, just like the *VIP Database* does, and keep them on a disk file.

I recently bought the *Schematic Drawing Processor* (*SDP*). Is there a similar program like the *Cad Cam* on the IBM (electronic drafting) for the CoCo 2 and/or 3?

*Jean Gravelle*
*713 Main Street #2*
*Gatineau, Quebec*
*Canada J8R 1G7*

*See "CoCoCad: The Schematic Scoundrel" published in the October 1985 issue (Page 130).*

### OS-9 P-P-P-Problems

*Editor:*

I own a CoCo 3 and have problems running OS-9 programs on it. Each time I strike a key it repeats itself a number of times, as if the machine is stuck in the "key auto-repeat mode."

I would like to know if others have experienced this problem.

*Eugene S. Ceschini*
*545 W. 8th Ave..*
*Tarentum, PA 15084*

### CoCo 3 Save/Load

*Editor:*

I really enjoyed Stephen Gunn's 64K version of "Analog-To-Digital and Back Again" program (October 1985, Page 87). I even had some of my favorite songs from my cassette collection on disk! The problem is that the Save/Load feature doesn't work properly on my new CoCo 3. Does anyone have any solutions?

*Chris Tripp*
*906 Jay Ryan Rd.*
*Goldsboro, NC 27530*

### CoCo 3 MikeyFix

*Editor:*

My problem is a program written by Mike Ward to configure *MikeyTerm* to run on my CoCo 3 that doesn't work up to standards. It won't let me see the full buffer screen, only the top eight lines. I can't get to the menu from terminal mode unless I'm online. Is there some way I can correct this myself, or is Mike Ward going to come out with a new version of *MikeyTerm* or a new convertor? I'm using the convertor on my version of *MikeyTerm 4* for the RS-232 pack.

*Michael Ray Todd (MIKERT)*
*10707 IH-10W #1823*
*San Antonio, TX 78230*

*If you are using a CoCo 3, you should be using* MikeyTerm *Version 4.3. Mike Ward can be contacted through Delphi: His username is MIKEWARD.*

### At Long Last, . . . Errors

*Editor:*

I have had my CoCo 3 for a year now and my first disappointment was to find it had no more memory available than the 64K machine it replaced. So I waited a year to

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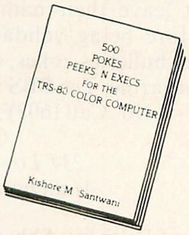

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finally get OS-9 Level II, thinking it was the answer (according to the Tandy clerk). But, after two weeks, all I have learned to do is format, backup, boot up BASIC09 and type in a large number of procedures that will not run.

When I type in a procedure as instructed in the manual, I get Error 051 — line with compiler error whenever I type `RUN`. `LOAD` gives me Error 216. Occasionally a 043 error pops up (unknown procedure) when trying to `RUN`. So here I am locked in a land of error with nothing telling me what to do to correct the error.

*Beatrice L. Weyrick*
*2173 Lynn Dr.*
*Akron, OH 44312*

*Editor's Note: We understand your frustration, but we have no simple answers for you. OS-9 takes time and effort to learn. However, here are a couple of pointers:*

1) *A listed line with an error of* any *type will prevent a program from running.*
2) *Your other errors (043, 214, 215 and 216) most likely result from improper selection of your current data and execution directories. Carefully read pages 4-1 through 5-10 of the Getting Started section of the OS-9 Level Two manual. Also, chapters one and nine of* The Complete Rainbow Guide to OS-9 Level II, Volume I: A Beginners Guide to Windows *will help immensely.*

### KUDOS

*Editor:*

I ordered the PBBS OS-9 Bulletin Board software from S.D. Roberson, 1702 W. Mt. View Dr., Mesa, AZ 85201, last year. Not being an expert at OS-9 but wanting to SysOp a BBS, I ordered it. Having trouble at first, I called the author for help. He took time out to help me with everything I needed. Now that I've worked with the author, I have learned the OS-9 operating system and can SysOp with the best of them. Best of all, he provides upgrades to the original version for minimal cost. Steve Roberson, my hat is off to you.

*Bill Davis*
*Weirton, WV*

### Slick Math

*Editor:*

I think that Louis Toscano's equation-graphing and equation-solving programs in the September RAINBOW are the slickest progams you've printed in a long time. Not that there isn't something of interest to me in every issue, but Louis has done a super-fantastic job. Now, I know I'm prejudiced 'cause I'm a math teacher, but that gives me the right to be a critic of math programs, too. One word to describe Louis' work . . . WOW!

*Richard H. Phillips*
*RHP*
*Snyder, NY*

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*164 Lewis Ave.*
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*Ricky Sutphin*
*Rt. 1 Box 20*
*Henry, VA 24102*

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*Jerry Downey*
*620 Sanderson Dr.*
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*Servalin Harlock*
*54937 High Ridge Road*
*High Ridge, OH 43992*

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*Jack Bowman*
*1010 Concord Ave.*
*Piqua, OH 45356*

- I run a BBS called CoBBS. It has been online in Oklahoma City for eight months. All computer users are welcome, but uploads and downloads are for the Color Computer! There are P/D pictures, music and many OS-9 files for Xmodem downloading. The system is run on a 512K CoCo 2, with six drives online. Users may log on at 300 or 1200 baud, 8 bit, no parity, 24 hours, 7 days a week. Call (405) 737-5580.

*Ronn Folk*
*1029 Hazelwood*
*Midwest City, OK 73110*

- I have recently opened a BBS system, the Coco-Connection. It is online 24 hours, 7, 8 bits, no parity, 300/1200 message base. Uploads, downloads. Call (206) 854-3744.

*Cors Bik*
*11216 S.E. 235th Pl.*
*Kent, WA 98031*

- I would like to announce the existence of The Master BBS. It has the best collection of files in New England available to its users. Users must leave their name and phone number before being validated. Message base includes bulletins, jokes, one-liners and an online magazine. The BBS runs 24 hours, 300 baud, 7-E-No. Call (603) 644-4867.

*George Proulx*
*234 Lowell St., Apt. 6*
*Manchester, NH 03104*

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*Ron Millar*
*Pontefex BBS*
*Belmont Abbey College*
*Belmont, NC 28012*

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*Robert Bohn, SysOp*
*51 Addison St.*
*Chelsea, MA 02150*

**THE RAINBOW welcomes letters to the editor. Mail should be addressed to: Letters to Rainbow, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. Letters should include the writer's full name and address. Letters may be edited for purposes of clarity or to conserve space.**

**Letters to the editor may also be sent to us through our Delphi CoCo SIG. From the CoCo SIG> prompt, type `RAI` to take you into the Rainbow Magazine Services area of the SIG. At the RAINBOW> prompt, type `LET` to reach the LETTERS> prompt and then select Letters for Publication. Be sure to include your complete name and address.**

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(See our Communications Extravaganza on Page 15!)

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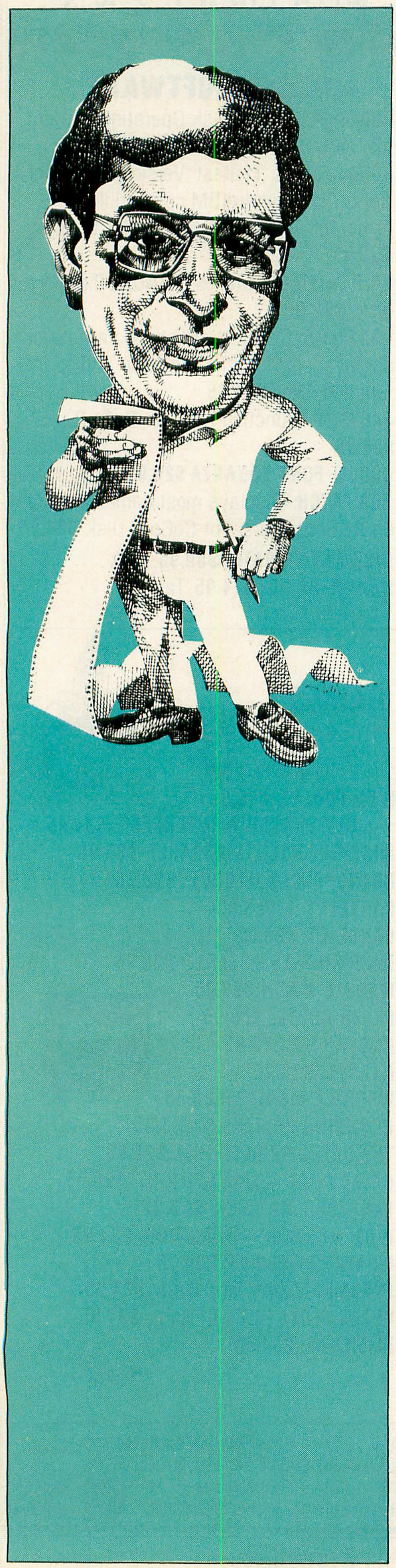

# An Exchange of Ideas

This is our telecommunications issue, right?

Right.

So, I'm going to break with tradition and, instead of rambling on about something or other, I'm actually going to talk about telecommunications.

Why?

Because, frankly and honestly, I think it is really neat. I also happen to think it will be telecommunications — not spreadsheets, databases and game programs — that will ultimately bring millions and millions of additional people into the world of computers.

My wife was out of town just the other day and some friends were kind enough to invite me over for some sustenance. Their daughter, 15-year-old Shannon, was in the midst of an argument with her 13-year-old brother Brian concerning use of the telephone.

Brian "needed" the telephone to hook into Delphi to look up something in the online encyclopedia. Shannon had numerous friends she "had" to call for a number of extremely important reasons.

The parents settled things, as parents will, by allocating time periods for telephone use. Brian got first crack, which caused some muttering from Shannon. Brian, however, allowed as how if he could print out the information from the encyclopedia, he wouldn't have to spend so much time on the telephone.

I volunteered to try to help out.

So all five tracked over to the computer and, while I was at it, I showed Brian how to get into conference. Suddenly there was interest on Shannon's part.

"Are there *boys* there?" she asked.

I told her there probably were.

By this time, Brian's allocation of phone time had ended. Rather than call her friends, Shannon asked for a short lesson on the computer and did, indeed, meet a boy in conference. Everyone else was shoo'ed away. Shannon ended up spending all her telephone time on the computer — and made a "date" for another meeting a couple of days later.

She's been hanging around Delphi ever since.

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My point here is simply that there is a great deal which can be done with your computer other than "computing." One of the most vast areas for all of this is in the area of telecommunications. You can meet people, get information, read other people's opinions and do a great variety of things. With the information services like Delphi and CompuServe, it's rather inexpensive, too.

Moreover, telecommunications represents a use of a computer that steps far beyond the bounds of "computing." I have always contended that the computer is merely the tool which allows you to build just whatever interests you — much like a hammer allows you to build physical things. Many of you have heard me quote Isaac Asimov that the computer is a "mind appliance." I think telecommunications allows you to expand your mind to touch many.

Because of this concept, we will, beginning this month, start experimenting with a new service on Delphi — a Books Special Interest Group.

This is a new and special concept because it goes away from the "traditional" in special interest groups, i.e., people who have computers and modems to begin with. I, frankly, think the going will be a little difficult for this SIG, because many of those who are to participate will not "automatically" have the means to do so — the computer.

Yet, I think an online book review is the kind of thing that should be done with an information service such as Delphi. The reason is a simple one: We plan to offer formal reviews of books, but we also plan to provide a means for the users of the SIG to make their own comments as well. Imagine. A review of a book with input from dozens of different people! No longer do you have to look at just what some fancy reviewer has to say, but you'll also have comments from a lot of different people as well. We hope to be able to use the conference feature to entice some well-known authors to get online and meet at various intervals. And, we'll be trying to keep an up-to-date best seller list available, too.

I've always been very interested in books and I love to read, so this is a natural expression for one of my main interests. At the same time, I know we'll have a hard row to hoe simply because many of those who are interested may not have computers — the tool necessary to be part of the Books SIG. My hope is that what we'll provide will not only lure many of you who like to read and who do have computers, but will encourage those whose primary interests are books and reading to get a computer and use it for these purposes.

Also, I think it would be really neat if those of you with other special interests used the CoCo SIG on Delphi as a meeting place for anything you want it to be. Maybe the teenager in your house would like to meet others in other parts of the country. We'll be happy to try to set something up and post a notice of a conference for you.

Or maybe you're interested in stamps, or cars, or needlepoint, or pig farming. Whatever. No one says that the SIG and its conferences (or forum, for that matter) have to concern themselves only with computers and computing. As an example, there's a pretty lively debate on foreign policy which surfaces from time to time on our PC/MS-DOS SIG.

All this boils down to is exchanging ideas. And, after all, isn't that what telecommunications is all about?

**—Lonnie Falk**

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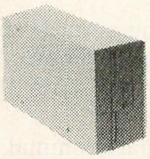

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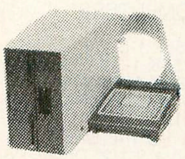

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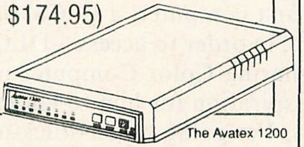

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## Building November's Rainbow

# The sooner you ACK . . .
# . . . the quicker you get the NAK

It might strike you as odd for me to be already doing a "guest spot" in what until recently was my own column, but I still feel right at home. And, though it was not always the case, I am very comfortable with this month's RAINBOW theme: Telecommunications.

Yes, I'm "into" telecommunications, a regular online party animal. I'm online, on average, about four or five times an evening, totalling about three hours a night. That's why new managing editor Jutta Kapfhammer asked me to do this month's column.

What is my fascination with telecommunications? That's easy: it's live! Once you've ventured out of your own home base into the network of telecommunications, they won't be able to keep you "down on the farm" anymore — not when you've transformed your screen into a window on the world. It's always an armchair adventure, because you just never know what you'll run into when you "go online, live." As often as I reach out, dial up and log on, there's still that feeling of anticipation each time I call a BBS or computer information network. When Delphi greets me with "Hello JIMREED" my screen seems to brighten a bit and the air fairly crackles with the surge of power. It's like you've just swung into the fast lane on a busy expressway. Once I'm on, I can hardly wait to see who else is on, and then I head for the Mail section with the same eagerness I had as a small-town kid waiting for the latest mail-order magic trick to arrive.

Now, computer to computer communications is by no means new; the technology has been around at least a quarter century. And, its terminal emulation capability was one of the selling points of the Color Computer right from the very start. In fact, Lonnie Falk bought his first computer, a CoCo, back in late 1980, only a few months after its introduction, in order to access a DEC computer from home. And, his early experiences of sharing Color Computer information with others on CompuServe provided the inspiration for him to launch THE RAINBOW.

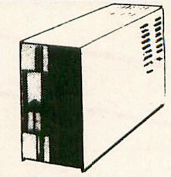
My own first, typical, timid, panicky, I'm-going-to-get-stuck-and-can't-get-out experience was on CompuServe, too. With practice, though, going online soon became old hat. These days, telecommunicating is such an integral and natural part of THE RAINBOW and Falsoft operation, the very thought of quitting would give several of us fits. It would be as devastating as yanking away our disk drives. In fact, I don't think it unfair to compare computing *without* telecommunications to restricting your TV viewing to video cassettes only and never watching broadcast TV. Does that sound a bit radical?

Well, naturally, there are differences. Ed Ellers, another online "regular," points out an interesting one. "With television, we began with live programming and prerecorded broadcasts and then, fairly recently, VCRs added the ability to 'time shift,' and even select your own programming. On the other hand, in computing, we usually have the "library" capacity from the start; later we explore the live dimension of data communications," permitting us to access the versatility and power of host computers and to interact with others. In both cases, the new flexibility has a dramatic impact on the way we use our CRTs. Personally, were I given the choice of giving up my modem or my VCR, the VCR would have to go; I still prefer "live" over Memorex.

If you have yet to discover the fun of "live" computing, may I remind you that we offer a lifetime membership to Delphi and an hour of connect time — a $32.15 value as a free bonus — if you subscribe to RAINBOW through our Delphi SIGs (see pages 114 and 115). When you discover that all the "RAINBOW people" and other CoCo Community celebrities are within such easy reach, well, you may become an online party animal, too.

**— Jim Reed**

# GREAT COCO III STUFF



## OS9 Lev.II Users - 720K/80 Tracks DS 31/2" DRIVES

Why are you limitng yourself to just 35 track, 160K single sided drives? Now you can step up to 720K, 80 track, double sided, 3 1/2" drives! You still can be compatible with 5 1/4 software by removing the filler plate & adding your existing 5 1/4" drive! (Or buy one from us!) Intro price **$229.95***

| | | | |
|---|---|---|---|
| Drive 1 (5 1/4") | $99.95 | Disk Controller | $99.95 |
| (10) 3 1/2" disks | $24.95 | OS-9 Controller | $149.95** |

* - Includes PS & Case and hookups for 2nd drive (5 1/4")
** - Eliminates OS9 type-ahead problems!
NOTE the 3 1/2 system ($229.95) doesn't include a conroller.
Also, the 5 1/4" drive must be a half-height drive.

## 300 COCO III POKES

Get more POWER for your CoCoIII. Has enhancements for CoCoIII Basic! **$19.95**

## RAINBOW GUIDE OS9 LEVEL II

Dale Puckett has done it again!! Vol.1: "A Beginners Guide to Windows". Almost 300 pages with helpful tips! **$19.95**
Rainbow Guide to OS9 Lev.II DISK **$19.95**

## COCO III UNRAVELED

A COMPLETE DISASSEMBLY of the CoCoIII's new ROM code! "Well worth the price"- Rainbow review. Over 100 pages! **$29.95**

## COLORMAX III & COLORMAX DELUXE (512K Version $69.95)

It's here! The CoCoIII BREAKTHROUGH PRODUCT everyone was waiting for! 320x200 graphics, pull down menus, icons the choice of any 16 colors from the CoCo III's 64 color palette plus RGB support! Eleven (11) fonts are included for hundreds of lettering styles and painting is a breeze with 16 colors and 32 editable patterns!!! Color Max III requires a 128K CoCo III and Hi-Res Joystick interface. (Specify printer!) $59.95. Color Max III Font Editor - create and modify fonts for use with Color Max III **$29.95**/Font Disk#1 (11 more Fonts!) **$19.95.** Hi-Res Joystick interface **$14.95.**

→ SPECIAL BONUS - BUY ABOVE 4 for only **$99.95** !!! (Add $10 for COLORMAX DELUXE version) ←

## TW-80 - 80 columns for TW-64 on CoCo III

See pg.138, 10/87 Rainbow review!

It's finally here! An 80 column version of Telewriter-64 for the CoCo III with TELEPATCH features plus much, much more! Includes PRINT SPOOLER & (2) ultra-fast RAM DISKS for 512K users, plus changeable CHARACTER FONTS & a setup CONFIG pgm. Req. TW-64 DISK & 128K CoCo III **$39.95** / TW-80 & TW-64 combo! **$99.95**

## PYRAMIX - Best CoCo III action game ever!

CoCoIII version of the popular 3D Cube Maze game, Cubix! Written exclusively to take ADVANTAGE of all the power in your CoCoIII. Colors are absolutely BRILLIANT, the graphics SHARP & the action HOT! 128K DISK **$29.95**

## 512K UPGRADE ($79.95*) LOWEST PRICES

OS9 Lev.II Ramdisk Driver $29.95

Easy installation with a superior design for a reliable upgrade, processing efficiency and AVAILABLE NOW for the CoCo III! (***$79.95** when purchased with our 512K RAM DISK program for **$24.95**) A 512K upgrade without RAM chips **$39.95** - The lowest upgrade prices in the Rainbow magazine, period!!! FREE 512K RAM sticker w/purchase !

## HI-RES JOYSTICK utility software BONANZA!

New useful programs for the Tandy Hi-Res Joystick Interface! Get FULL 640X640 mouse & joystick resolution from BASIC or run both CoCoMaxII & MaxEdit on the CoCoIII w/o the CoCoMax cartridge & get a 256X192 screen! **$24.95**

## RGB PATCH - No more BLACK & WHITE dots ...

Did you buy an expensive RGB monitor (CM-8) just so that you could see your Hi-Res artifacting CoCo 2 games in BLACK & WHITE ??? RGB PATCH converts most games to display in COLOR on an RGB monitor. 128K DISK **$29.95**

## COCO NEWSROOM - 22 Fonts & 50 Pictures!

Compose your own "CoCo NEWSPAPER" w/BANNER HEADLINES & 6 ARTICLES using a SOPHISTICATED graphics editor with importing of PICTURES, FONTS & FILL PATTERNS from disk. Over 140K of code & WYSIWYG! CoCoIII DISK **$49.95**

## MAGNAVOX 8515 ($299.95*) LOWEST PRICES

Sharper & Brighter than Tandy CM-8!

Do NOT be FOOLED! The CM-8 has a dot-pitch of .52mm & will not work with any other computer or VCR! The '8515' has a SHARP .42mm dot-pitch, will work with IBM PCs/Tandy 1000 and its COLOR COMPOSITE input displays PMODE4 artifact colors unlike the CM-8! ***$299.95** when purchased with a **$24.95** CoCoIII cable - Add **$14** shipping.

| | | | | | |
|---|---|---|---|---|---|
| CoCo III 512K RAM sticker | **$4.99** | CoCo III Multipak PAL chip | **$19.95** | Better CoCoIII Graphics | **$24.95** |
| Level II Quick Ref Guide | **$4.99** | CoCoIII Assembly Language | **.$19.95** | CoCo III Service Manual | **$39.95** |
| Level II Basic09 binder | **..$9.95** | Guide to CoCoIII Graphics | **.$21.95** | 512K CoCo III Computer | **$299.95** |

**FASTDUPE** 512 Format & Backup up to 4 single- /double-sided, 35/40 trk disks in 1 PASS! Even OS9 Lev.II! **$19.95**
**BIG BUFFER** - 437,888 byte spooler for a 512K CoCoIII! Print up to 200 text pages while using your CoCo! **$19.95**
**OS-9 Level II Font Editor $29.95**

512K
CoCo III
Software

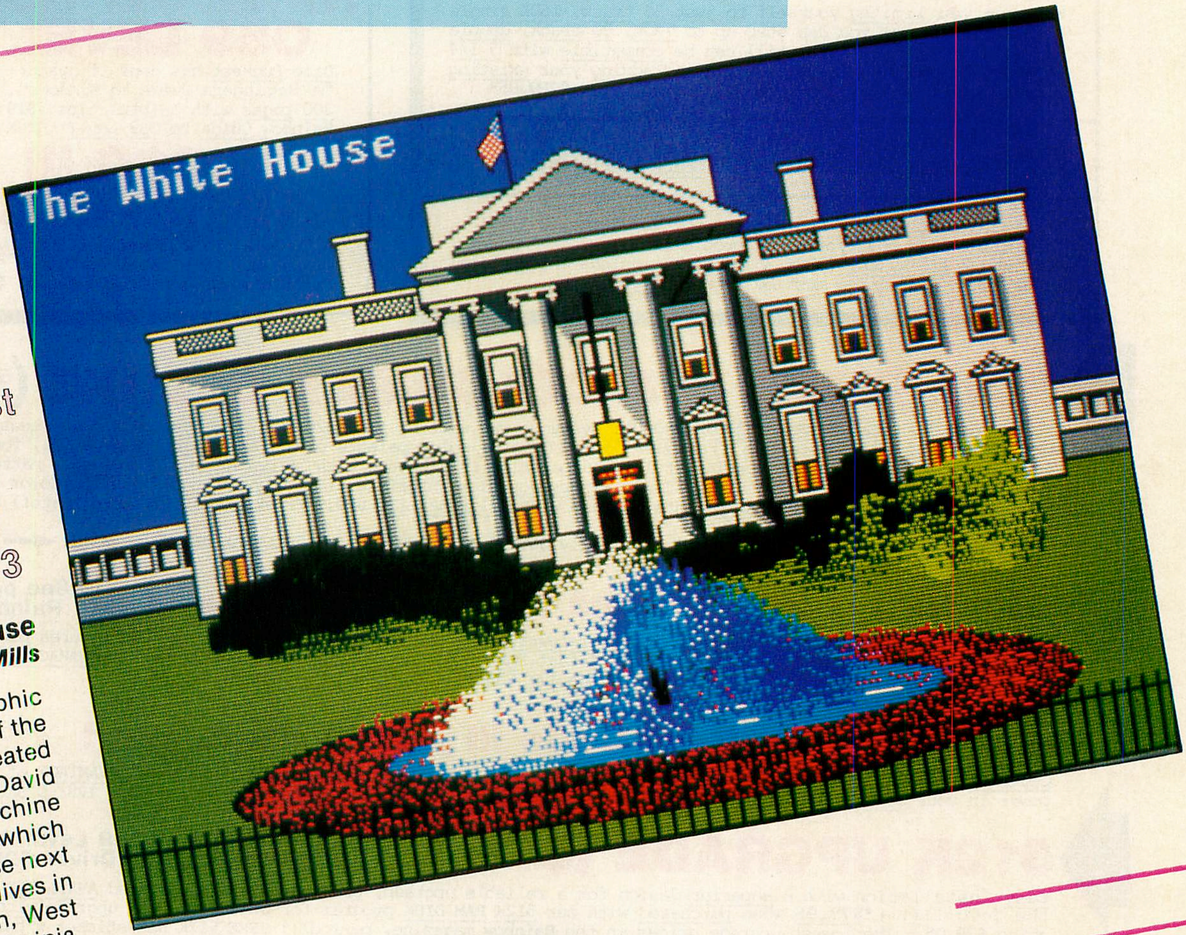
All orders plus $3 S/H (Foreign add $5) - NYS Residents add Sales Tax
Most orders shipped from stock. Allow 1-3 weeks for processing backorders.

## SPECTRUM PROJECTS

PO BOX 264 HOWARD BEACH NY 11414
See our other ads on pages 27 & 29 !!!

Buy'em
both for
$29.95

# The CoCo Gallery

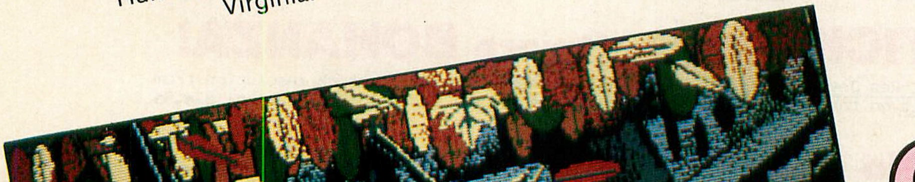


1st

COCO 3

**White House**
***David Mills***

This graphic representation of the White House was created with *Color Max 3*. David is working on a machine language program which he hopes to release next year. He lives in Huntington, West Virginia.



2nd

**Autumn Hunt**
***John Murvine***

John created this unique and striking graphic of hunting season, which begins this month, with *Color Max 3*. He lives in Ebensburg, Pennsylvania.

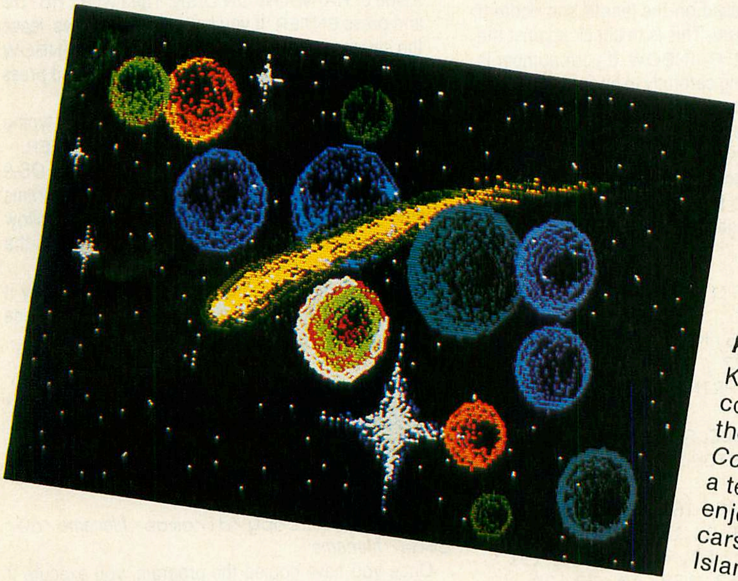
**SHOWCASE YOUR BEST!** You are invited to nominate original work for inclusion in upcoming showings of "CoCo Gallery." Share your creations with the CoCo Community! Be sure to send a cover letter with your name, address and phone number, detailing how you created your picture (what programs you used, etc.) and how to display it. Also, please include a few facts about yourself.

Don't send us anything owned by someone else; this means no game screens, digitized images from TV programs or material that's already been submitted elsewhere. A digitized copy of a picture that appears in a book or magazine is *not* an original work.

We will award two first prizes of $25, one for the CoCo 3 and one for the CoCo 1 and 2; one second prize of $15 and one third prize of $10. Honorable Mentions may also be given.

Please send your entry on either tape or disk to the CoCo Gallery, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. Remember, this is a contest and your entry will not be returned.

**— Angela Kapfhammer, Curator**



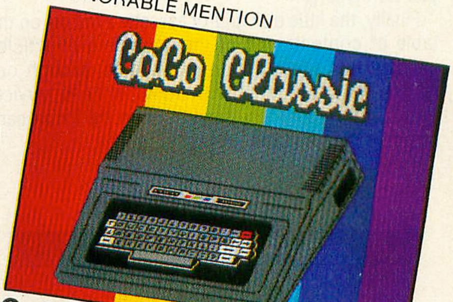
3rd

**The Bubble Zone**

***Keith Schuler***

Keith created this cosmic scene using the CoCo 3 and *CoCo Canvas*. Keith, a tenth-grader who enjoys racing model cars, lives in Merritt Island, Florida.

HONORABLE MENTION



**CoCo Classic**

***Logan Ward***

Logan lives in Memphis, Tennessee, and designed this detailed graphic with *Color Max 3*. He is head technician for the Computer Center.

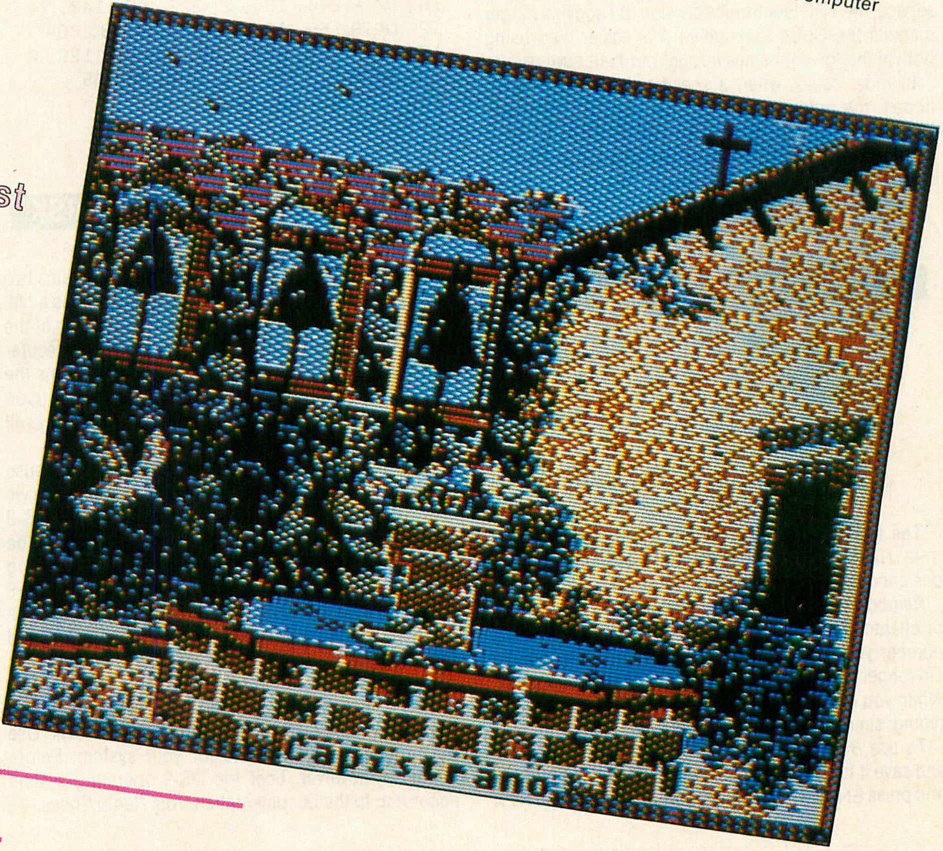
1st

COCO 1 & 2

**San Juan Capistrano Mission**

***Floyd Keirnan***

Floyd used *Graphicom* and a pixel editor from *CoCo Draw* to produce this graphic creation. He got the idea from an oil painting he did several years ago. Floyd is a retired electronics engineer and he lives in Orange, California.



# RAINBOW Info

## How To Read Rainbow

Please note that all the BASIC program listings in THE RAINBOW are formatted for a 32-character screen — so they show up just as they do on your CoCo screen. One easy way to check on the accuracy of your typing is to compare what character "goes under" what. If the characters match — and your line endings come out the same — you have a pretty good way of knowing that your typing is accurate.

We also have "key boxes" to show you the *minimum* system a program needs. But, *do* read the text before you start typing.

Finally, the little disk and/or cassette symbols on the table of contents and at the beginning of articles indicate that the program is available through our RAINBOW ON DISK or RAINBOW ON TAPE service. An order form for these services is on the insert card bound in the magazine.

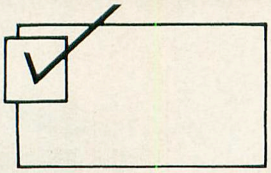
## What's A CoCo?

CoCo is an affectionate name that was first given to the Tandy Color Computer by its many fans, users and owners.

However, when we use the term CoCo, we refer to both the Tandy Color Computer and the TDP System-100 Computer. (While many TDP-100s are still in service, the TDP Electronics division of Tandy no longer markets the CoCo look-alike.) It is easier than using both of the "given" names throughout THE RAINBOW.

In most cases, when a specific computer is mentioned, the application is for that specific computer. However, since the TDP System-100 and Tandy Color are, for all purposes, the same computer in a different case, these terms are almost always interchangeable.

## Rainbow Check Plus



The small box accompanying a program listing in THE RAINBOW is a "check sum" system, which is designed to help you type in programs accurately.

*Rainbow Check PLUS* counts the number and values of characters you type in. You can then compare the number you get to those printed in THE RAINBOW. On longer programs, some benchmark lines are given. When you reach the end of one of those lines with your typing, simply check to see if the numbers match.

To use *Rainbow Check PLUS*, type in the program and save it for later use, then type in the command `RUN` and press ENTER. Once the program has run, type `NEW` and press ENTER to remove it from the area where the program you're typing in will go.

Now, while keying in a listing from THE RAINBOW, whenever you press the down arrow key, your CoCo gives the check sum based on the length and content of the program in memory. This is to check against the numbers printed in THE RAINBOW. If your number is different, check the listing carefully to be sure you typed in the correct BASIC program code. For more details on this helpful utility, refer to H. Allen Curtis' article on Page 21 of the February 1984 RAINBOW.

Since *Rainbow Check PLUS* counts spaces and punctuation, be sure to type in the listing exactly the way it's given in the magazine.

```
10 CLS:X=256*PEEK(35)+178
20 CLEAR 25,X-1
30 X=256*PEEK (35)+178
40 FOR Z=X TO X+77
50 READ Y:W=W+Y:PRINT Z,Y;W
60 POKE Z,Y:NEXT
70 IFW=7985THEN80ELSEPRINT
   "DATA ERROR":STOP
80 EXEC X:END
90 DATA 182, 1, 106, 167, 140, 60, 134
100 DATA 126, 183, 1, 106, 190, 1, 107
110 DATA 175, 140, 50, 48, 140, 4, 191
120 DATA 1, 107, 57, 129, 10, 38, 38
130 DATA 52, 22, 79, 158, 25, 230, 129
140 DATA 39, 12, 171, 128, 171, 128
150 DATA 230, 132, 38, 250, 48, 1, 32
160 DATA 240, 183, 2, 222, 48, 140, 14
170 DATA 159, 166, 166, 132, 28, 254
180 DATA 189, 173, 198, 53, 22, 126, 0
190 DATA 0, 135, 255, 134, 40, 55
200 DATA 51, 52, 41, 0
```

## OS-9 and RAINBOW ON DISK

The OS-9 side of RAINBOW ON DISK contains two directories: `CMDS` and `SOURCE`. It also contains a file, `read.me.first`, which explains the division of the two directories. The `CMDS` directory contains executable programs and the `SOURCE` directory contains the ASCII source code for these programs. BASIC09 programs will only be offered in source form so they will only be found in the `SOURCE` directory.

OS-9 is a very powerful operating system. Because of this, it is not easy to learn at first. However, while we can give specific instructions for using the OS-9 programs, you will find that the OS-9 programs will be of little use unless you are familiar with the operating system. For this reason, if you haven't "learned" OS-9 or are not comfortable with it, we suggest you read *The Complete Rainbow Guide to OS-9* by Dale Puckett and Peter Dibble.

The following is not intended as a course in OS-9. It merely states how to get the OS-9 programs from RAINBOW ON DISK to your OS-9 system disk. Use the procedures appropriate for your system. Before doing so, however, boot the OS-9 operating system according to the documentation from Radio Shack.

1) Type `load dir list copy` and press ENTER.
2) If you have only one disk drive, remove the OS-9 system disk from Drive 0 and replace it with the OS-9 side of RAINBOW ON DISK. Then type `chd/d0` and press ENTER. If you have two disk drives, leave the sytem master in Drive 0 and put the RAINBOW ON DISK in Drive 1. Then type `chd/d1` and press ENTER.
3) List the `read.me.first` file to the screen by typing `list read.me.first` and pressing ENTER.
4) Entering `dir` will give you a directory of the OS-9 side of RAINBOW ON DISK. To see what programs are in the `CMDS` directory, enter `dir cmds`. Follow a similar method to see what source files are in the `SOURCE` directory.
5) When you find a program you want to use, copy it to the `CMDS` directory on your system disk with one of the following commands:

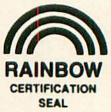
One-drive system: `copy /d0/cmds/` *filename* `/d0/cmds/` *filename* `-s`

The system will prompt you to alternately place the source disk (RAINBOW ON DISK) or the destination disk (system disk) in Drive 0.

Two-drive system: `copy /d1/cmds/` *filename* `/d0/cmds/` *filename*

Once you have copied the program, you execute it from your system master by placing that disk in Drive 0 and entering the name of the file.

## The Rainbow Seal



*The Rainbow Certification Seal* is our way of helping you, the consumer. The purpose of the Seal is to certify to you that any product that carries the Seal has actually been seen by us, that it does, indeed, exist and that we have a sample copy here at THE RAINBOW.

Manufacturers of products — hardware, software and firmware — are encouraged by us to submit their products to THE RAINBOW for certification. We ascertain that their products are, in actuality, what they purport to be and, upon such determination, award a Seal.

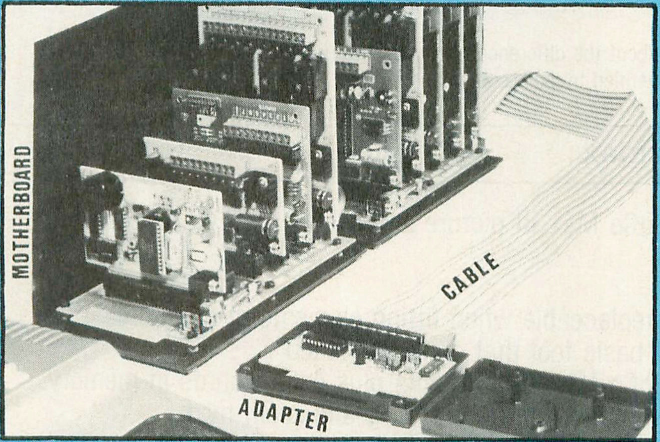
The Seal, however, is not a "guarantee of satisfaction." The certification process is different from the review process. You are encouraged to read our reviews to determine whether the product is right for your needs.

There is absolutely no relationship between advertising in THE RAINBOW and the certification process. Certification is open and available to any product pertaining to CoCo. A Seal will be awarded to *any* commercial product, regardless of whether the firm advertises or not.

We will appreciate knowing of instances of violation of Seal use.

# The Amazing A-BUS

**NEW**



**An A-BUS system with two Motherboards**
**A-BUS adapter in foreground**

**The A-BUS system works with the original CoCo, the CoCo 2 and the CoCo 3.**

## Plug into the future

With the A-BUS you can plug your PC (IBM, Apple, TRS-80) into a future of exciting new applications in the fields of control, monitoring, automation, sensing, robotics, etc.

Alpha's modular A-BUS offers a proven method to build your "custom" system today. Tomorrow, when you are ready to take another step, you will be able to add more functions. This is ideal for first time experimenting and teaching.

A-BUS control can be entirely done in simple BASIC or Pascal, and no knowledge of electronics is required!

An A-BUS system consists of the A-BUS adapter plugged into your computer and a cable to connect the Adapter to 1 or 2 A-BUS cards. The same cable will also fit an A-BUS Motherboard for expansion up to 25 cards in any combination.

The A-BUS is backed by Alpha's continuing support (our 11th year, 50000 customers in over 60 countries).

The complete set of A-BUS User's Manuals is available for $10.

## About the A-BUS system:

- All the A-BUS cards are very easy to use with any language that can read or write to a Port or Memory. In BASIC, use INP and OUT (or PEEK and POKE with Apples and Tandy Color Computers)
- They are all compatible with each other. You can mix and match up to 25 cards to fit your application. Card addresses are easily set with jumpers.
- A-BUS cards are shipped with power supplies (except PD-123) and detailed manuals (including schematics and programming examples).

### Relay Card RE-140: $129

Includes eight industrial relays. (3 amp contacts. SPST) individually controlled and latched. 8 LED's show status. Easy to use (OUT or POKE in BASIC). Card address is jumper selectable.

### Reed Relay Card RE-156: $99

Same features as above, but uses 8 Reed Relays to switch low level signals (20mA max). Use as a channel selector, solid state relay driver, etc.

### Analog Input Card AD-142: $129

Eight analog inputs. 0 to +5V range can be expanded to 100V by adding a resistor. 8 bit resolution (20mV). Conversion time 120us. Perfect to measure voltage, temperature, light levels, pressure, etc. Very easy to use.

### 12 Bit A/D Converter AN-146: $139

This analog to digital converter is accurate to .025%. Input range is −4V to +4V. Resolution: 1 millivolt. The on board amplifier boosts signals up to 50 times to read microvolts. Conversion time is 130ms. Ideal for thermocouple, strain gauge, etc. 1 channel. (Expand to 8 channels using the RE-156 card).

### Digital Input Card IN-141: $59

The eight inputs are optically isolated, so it's safe and easy to connect any "on/off" devices, such as switches, thermostats, alarm loops, etc. to your computer. To read the eight inputs, simply use BASIC INP (or PEEK).

### 24 Line TTL I/O DG-148: $65

Connect 24 input or output signals (switches or any TTL device) to your computer. The card can be set for: input, latched output, strobed output, strobed input, and/or bidirectional strobed I/O. Uses the 8255A chip.

### Clock with Alarm CL-144: $89

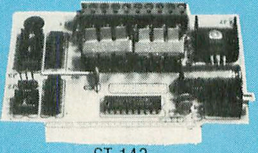
Powerful clock/calendar with: battery backup for Time, Date and Alarm setting (time and date); built in alarm relay, led and buzzer; timing to 1/100 second. Easy to use decimal format. Lithium battery included.

### Touch Tone® Decoder PH-145: $79

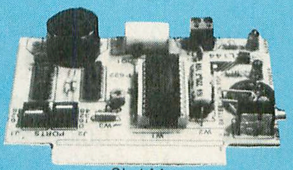
Each tone is converted into a number which is stored on the board. Simply read the number with INP or POKE. Use for remote control projects, etc.

### A-BUS Prototyping Card PR-152: $15

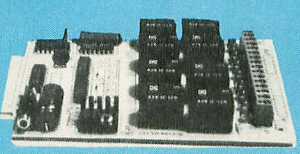
3½ by 4½ in. with power and ground bus. Fits up to 10 I.C.s



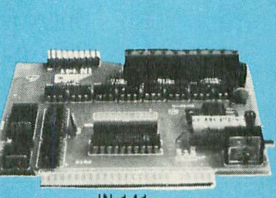
ST-143



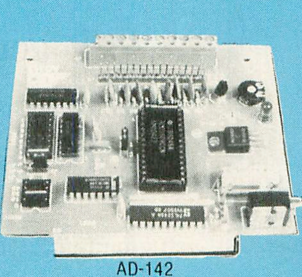
CL-144



RE-140



IN-141



AD-142

### Smart Stepper Controller SC-149: $299

World's finest stepper controller. On board microprocessor controls 4 motors simultaneously. Incredibly, it accepts plain English commands like "Move arm 10.2 inches left". Many complex sequences can be defined as "macros" and stored in the on board memory. For each axis, you can control: coordinate (relative or absolute), ramping, speed, step type (half, full, wave), scale factor, units, holding power, etc. Many inputs: 8 limit & "wait until" switches, panic button, etc. On the fly reporting of position, speed, etc. On board drivers (350mA) for small steppers (MO-103). Send for SC-149 flyer.

**Remote Control Keypad Option RC-121: $49**
To control the 4 motors directly, and "teach" sequences of motions.

**Power Driver Board Option PD-123: $89**
Boost controller drive to 5 amps per phase. For two motors (eight drivers).

**Breakout Board Option BB-122: $19**
For easy connection of 2 motors. 3 ft. cable ends with screw terminal board.

### Stepper Motor Driver ST-143: $79

Stepper motors are the ultimate in motion control. The special package (below) includes everything you need to get familiar with them. Each card drives two stepper motors (12V, bidirectional, 4 phase, 350mA per phase).

**Special Package:** 2 motors (MO-103) + ST-143: **PA-181: $99**

### Stepper Motors MO-103: $15 or 4 for $39

Pancake type, 2¼" dia, ¼" shaft, 7.5°/step, 4 phase bidirectional, 300 step/sec, 12V, 36 ohm, bipolar, 5 oz-in torque, same as Airpax K82701-P2.

### Current Developments

Intelligent Voice Synthesizer, 14 Bit Analog to Digital converter, 4 Channel Digital to Analog converter, Counter Timer, Voice Recognition.

### A-BUS Adapters for:

| | |
|---|---|
| IBM PC, XT, AT and compatibles. Uses one short slot. | AR-133...$69 |
| Tandy 1000, 1000 EX & SX, 1200, 3000. Uses one short slot. | AR-133...$69 |
| Apple II, II+, IIe. Uses any slot. | AR-134...$49 |
| TRS-80 Model 102, 200 Plugs into 40 pin "system bus". | AR-136...$69 |
| Model 100. Uses 40 pin socket. (Socket is duplicated on adapter). | AR-135...$69 |
| TRS-80 Mod 3,4,4D. Fits 50 pin bus. (With hard disk, use Y-cable). | AR-132...$49 |
| TRS-80 Model 4P. Includes extra cable. (50 pin bus is recessed). | AR-137...$62 |
| TRS-80 Model I. Plugs into 40 pin I/O bus on KB or E/I. | AR-131...$39 |
| Color Computers (Tandy). Fits ROM slot. Multipak, or Y-cable. | AR-138...$49 |

### A-BUS Cable (3 ft, 50 cond.) CA-163: $24

Connects the A-BUS adapter to one A-BUS card or to first Motherboard.

**Special cable for two A-BUS cards: CA-162: $34**

### A-BUS Motherboard MB-120: $99

Each Motherboard holds five A-BUS cards. A sixth connector allows a second Motherboard to be added to the first (with connecting cable CA-161: $12). Up to five Motherboards can be joined this way to a single A-BUS adapter. Sturdy aluminum frame and card guides included.

- The A-BUS is not a replacement for the Multi-pak

**Add $3.00 per order for shipping.**
**Visa, MC, checks, M.O. welcome.**
**CT & NY residents add sales tax.**
**C.O.D. add $3.00 extra.**
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**Overseas add 10%**

**ALPHA Products**
a Sigma Industries Company
242-W West Avenue, Darien, CT 06820

Technical info: **(203) 656-1806**
Orders only Except in CT **800 221-0916**
Connecticut orders: **(203) 348-9436**
All lines open weekdays 9 to 5 Eastern time

## COMPARISON

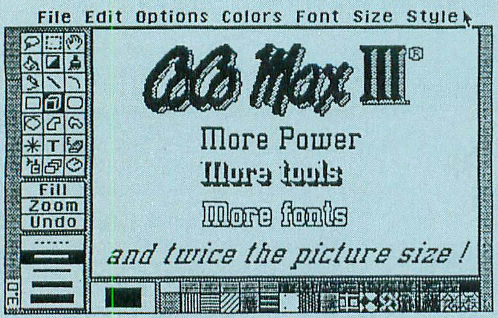
# CoCo Max III vs. Colormax

by Colorware

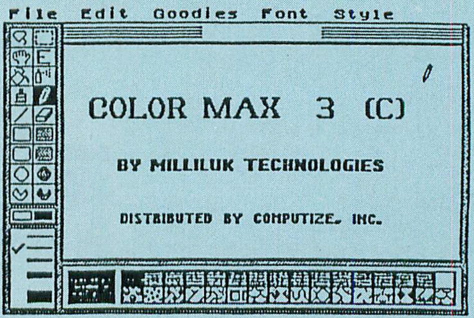
by Computize

This chart was established to answer the many questions asked about the differences between the two programs.
All facts mentioned in this chart have been verified by both companies.

| Features | CoCo Max III ▼ | Colormax ▼ | Comments |
|---|---|---|---|
| Size of the picture: 320 by | 384 | 192 | CoCo Max III picture is twice as large (2 screens high). |
| Number of drawing tools: | 28 | 18 | |
| Basic Tools (Pencil, Brush, Spray, etc.): | Yes | Yes | |
| Shrink and Stretch: | Yes | No | Irreplaceable when fitting elements of a picture. |
| Rotate: | Yes | No | A basic tool that can't be "faked". |
| 512K Memory support: | Yes | None | CoCo Max III has fonts plus 4 Clipboards in memory. |
| "Undo" feature always available: | Yes | No | No "Undo" in text, editing and zoom mode. |
| All tools work in zoom mode: | Yes | No | The "pencil" is the only tool that works in Zoom mode. |
| Animation Feature: | Yes | No | Only fixed picture. |
| Color Sequencing: | Yes | None | Amazing special effects are not possible. |
| Choice of size for letters, text: | Yes | No | Font size is fixed. |
| Price includes Hi-Res Joystick Interface: | Yes | No | Must buy the Radio Shack joystick interface ($10). |
| Free CoCo Show: programmable "Slide Show": | Yes | No | |
| Automatic pattern alignment: | Yes | No | Working with patterns is tedious without this feature. |
| Print in single and double size: | Yes | No | Only one size printout. |
| Smart Lasso (move text over background...): | Yes | No | |
| Advanced tools: Arc, Ray, Cubes, etc.: | Yes | None | Arcs cannot be simulated with other "tools". |
| Number of fonts: | 13 | 11 | |
| Extra Fonts available: | 90+ | ? | No fonts were available as of this report. |
| Supports more than one printer: | Yes | No | You must buy one version for each printer. |
| Undo/Redo (to see before and after changes): | Yes | No | The Colormax Undo is not reversible. |
| 64 Colors shown when setting palette: | Yes | No | Colors are shown 16 at a time. |
| Free CoCo Max II Picture converter: | Yes | No | $29.95 option. |
| Free Max Font Conversion: | Yes | No | A different $29.95 option. |
| Extensive Pompting: | Yes | No | |
| "Glyphic" Clipbook or "Rubber Stamps": | Yes | N/A | |
| Number of paint brush shapes: | 40 | 16 | However you can edit your own. |
| Two Color and 3-D lettering: | Yes | No | |
| "Double Click" shortcuts: | Yes | None | Must always pull menu down. |
| Color mixing (additive/subtractive/none): | Yes | No | Only "paint over" mode available. |
| Printing colors in shades of gray: | Yes | No | Only full black and white. No "halftone" |
| Tech Line and Toll free order line: | Yes | No | |
| Money back guarantee: | Yes | No | |



CoCo Max III®
More Power
More tools
More fonts
and twice the picture size!



COLOR MAX 3 (C)
BY MILLILUK TECHNOLOGIES
DISTRIBUTED BY COMPUTIZE, INC.

Conclusion: Colormax is not a serious contender for the real CoCo Max III by Colorware.
Colorware's money back guarantee speaks for itself.

# INTRODUCING THE NEXT GENERATION: CoCo Max™ III*

More Resolution
More Power
More Color
Built-in Animation
More Speed
More Type Styles
More Tools
Amazing Color Sequencing

## *"The best program ever written for the Color Computer"*

That's how thousands of enthusiastic users rated the **CoCo Max II** drawing program. With **CoCo Max III** we are ready to amaze them again. Instead of "patching" CoCo Max II, we rewrote it from scratch to take advantage of the CoCo Max III hardware. The results will knock your socks off! Below is a brief list of some of the *new* features, but some, such as **animation, color sequencing**, or the **slide show**, have to be seen. Send for the Demo Disk, and see for yourself.

**Everybody's favorite drawing package features:**
- A 50% larger editing window. - Zoom area **400%** larger. - New drawing tools: **rays, 3D cubes, arcs,...** - New editing tools: shadow,text size,... - Rotate by 1.5° steps - Select any 16 of the 64 possible colors (all 64 colors displayed at once!) - Powerful **color mix**: additive, subtractive, overlay,... - Full **color editing** of patterns and color changing patterns. - Incredible **special effects** with **color cycling** up to 8 colors with variable speed. -**Animation** adds the dimension of motion to your image. (Must be seen.) - Sophisticated data compression saves up to 70% of disk space when saving pictures.
In addition, there are dozens of enhancements to the multitude of features that made CoCo Max II a best seller.

**More about CoCo Max III**
- CoCo Max III is not an upgrade of CoCo Max II. It is entirely rewritten to take advantage of the new CoCo 3 hardware (More memory, resolution, colors, speed,...)
- The new CoCo Max III **Hi-Res Interface** and the CoCo Max II **Hi-Res Pack** are *not* interchangable.
- The new interface plugs into the joystick connector.
- The CoCo Max III disk is not copy protected.
- CoCo Max III only works with the CoCo 3.
- A Y-Cable or Multi-pak is not necessary.
- Colors are printed in five shades of gray.
- CoCo Max III can read CoCo Max II pictures.

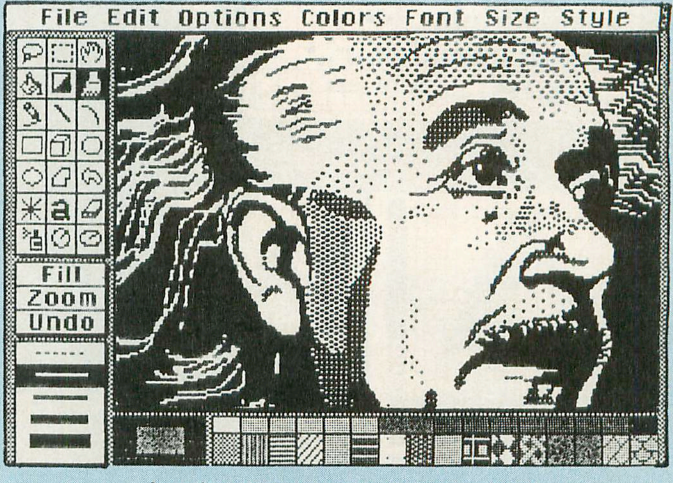
Note: CoCo Max II (for the CoCo 2) is still available on disk ($79.95). CoCo Max I is still available on tape ($69.95). For details, refer to our double page ad in any *Rainbow* from January '86 to July '87

Toll Free operators are for orders only. If you need precise answers, call the **tech line.** (Detailled CoCo Max specs are included with the Demo Disk.)

**Add $3.00 per order for shipping.**
**Visa, MC, checks, M.O. welcome.**
**CT residents add sales tax.**
**C.O.D. add $3.00 extra.**
**Canada: shipping is $5**
**Overseas add 10%**

Technical info: (203) 656-1806
Orders only Except in CT **800 221-0916**
Connecticut orders: (203) 348-9436
All lines open weekdays 9 to 5 Eastern time

* Beware of inferior imitations that *DO NOT* include a Hi-Res Interface or charge extra for each utility.



**Imagine this picture in sixteen colors!**

**Guaranteed Satisfaction**
**Use CoCo Max for a full month.**
**If you are not delighted with it,**
**we will refund every penny.**

**System Requirements:**
Any CoCo 3 disk system with a Joystick or a Mouse.
We apologize to tape users, CoCo Max III needs the flexibility of a disk.

The **CoCo Max III** system includes: • The special Hi-Res interface (for your mouse or joystick) • The CoCo Max III disk • Many utilities: (To convert Max II pictures, Max colors, etc.) • A detailled User's Manual. Complete system; nothing else to buy. **CoCo Max III: $79.95***

WITH COUPON ONLY

## FREE DEMO DISK

Name

Street

City

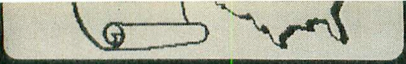
State Zip

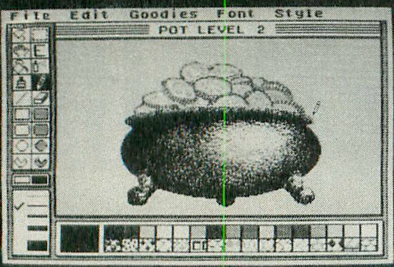
Printer used:

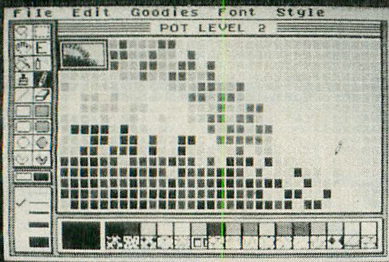
Please include $2 to help defray Processing and Shipping costs. (Check, Money Order, etc. Sorry, no COD or Credit Cards). Coupon (or copy) must be mailled to:

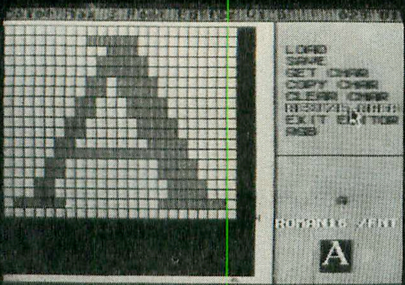
**COLORWARE**
A division of Sigma Industries, Inc.

*COLORWARE*
*242-W West Avenue*
*Darien, CT 06820*




File Edit Goodies Font Style
POT LEVEL 2


File Edit Goodies Font Style
POT LEVEL 2


LOAD
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GET CHAR
COPY CHAR
CLEAR CHAR
EXIT EDITOR
RGB
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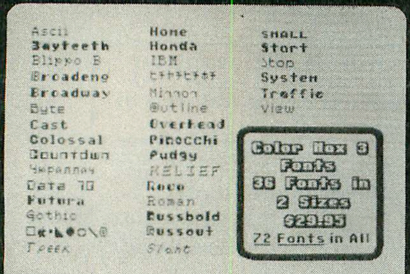
Ascii
Bayteeth
Blippo B
Broadeng
Broadway
Byte
Cast
Colossal
Countdwn
Data 70
Futura
Gothic
Greek
Home
Honda
IBM
Minnon
Outline
Overhead
Pinocchi
Pudgy
RELIEF
Roco
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Script
SMALL
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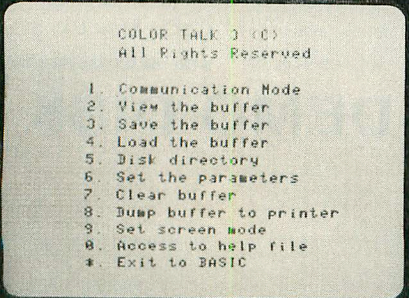
36 Fonts in
2 Sizes
$29.95
72 Fonts in All



```
COLOR TALK 3 (C)
All Rights Reserved

1. Communication Mode
2. View the buffer
3. Save the buffer
4. Load the buffer
5. Disk directory
6. Set the parameters
7. Clear buffer
8. Dump buffer to printer
9. Set screen mode
0. Access to help file
*. Exit to BASIC
```

"fun things to do" - with a
DEAD
DISK!
R.I.P.
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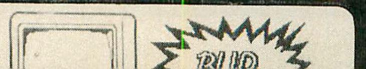


# The Best . . .

# "CoCo Product of the Year"

## COLOR MAX 3©

Unleash the power of your CoCo 3 with 320 x 200 screen resolution, and the choice of any 16 colors from the CoCo 3's 64 color palette, and your graphic creations almost can't help but come alive with color and detail. Icons, pull down menus, and dialog boxes make COLOR MAX 3 very easy to use. 11 fonts are supplied, making hundreds of lettering styles possible. Text can use any combinations of color, shadow, outline, bold, and italics. Painting is a snap with 16 colors and 32 editable patterns. COLOR MAX 3 requires a 128K CoCo 3 with disk drive, High-Resolution Joystick interface, and a joystick device (mouse, touch pad, or joystick). Print drivers supplied for most popular printers. CGP 220 driver provides beautiful 16 color print-outs.

**Cat. # 205MD** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . $59.95

**Standard Hi-Res Joystick Interface**
(Radio Shack # 26-5028)
**Cat. # 221CH . . . . . . . . . . . . . . . $12.00**

**Color Max 3 Font Editor**©
Create/Modify fonts for use with Color Max 3. Create Keyboard driven Icons. Customize existing fonts. Works in a "Fat Bits" type mode. Variable Height & Width. Let your imagination "go to work"!
**Cat. # 224MD . . . . . . . . . . . . . . . $29.95**

**CM3 Basic Tool & Gallery**©
Load & Save "MGE" pictures for display outside of Color Max 3. Incorporate into basic programs. Gallery lists all MGE files-just Point & Display!
**Cat. # 225MD . . . . . . . . . . . . . . . $19.95**

**Color Max 3 FONTS**©
36 Fonts in two sizes
72 fonts in all!
**Cat. # 223CD . . . . . . . . . . . . . . . $19.95**

**Picture Converter 1**©
6 Picture Format Converters:
- **CoCo Max B&W to "MGE"**
- **CoCo Max artifact to "MGE"**
- **6K B&W binary file to "MGE"**
- **6K artifact binary to "MGE"**
- **Graphicom B&W to "MGE"**
- **Graphicom artifact to "MGE"**

(MGE is Color Max 3 Pix format)
**Cat. # 220MD . . . . . . . . . . . . . . . $29.95**

**Picture Converter 2**©
Converts ATARI™ Low Res 320x200 picture files to "MGE" format used by Color Max 3. Works with ATARI pictures with file extensions .ST, .NEO, and .TNY.

NOTE: This utility is designed to allow the user to retrieve picture files from Bulletin Boards and Information Services. Files must be "Un-Arced".
Most databases have "UN-ARC" utilities available.
**Cat. # 222MD . . . . . . . . . . . . . . $29.95**

**INTRODUCING . . .**

## COLOR TALK 3©

**The Complete Terminal/Communications Program you've been waiting for!**

Ideal for accessing Compuserve, Delphi and other Information Services. Send your Color Max 3 "MGE" pictures to friends and fellow COCO users. **THIS IS THE ONLY COMMUNICATIONS PROGRAM AVAILABLE FOR YOUR COCO WITH ALL OF THIS POWER!** Compare COLOR TALK 3 with programs for the "PC" market costing 4 to 5 times as much. I'm sure you'll agree that COLOR TALK 3 represents real value for your COCO Dollars!

**Just look at this partial list of Impressive Features:**

•Supports COCO 3 as well as COCO 1 & 2. •Screen Display options: COCO 3: 80x24, 40x24, 32x16 . . . Standard COCO: 32x60, 32x24, 51x24, 64x24, 85x24. •Supports PBJ Wordpack & Double 80+. •XMODEM & YMODEM. •Upload & Download. •Save to buffer or direct to disk. •Full ASCII XON/XOFF support. •ASCII filtering. •ASCII buffering. •Customizer-set and store frequently used options/parameters. •10-64 character user programmable macros. •Conference/Chat mode. •Selectable Baud rates of 110, 300, 600, 1200, 2400, 4800, 9600 (Radio Shack RS232 Ram required for baud rates above 2400). •Parity: Odd, Even, Mark, Space, None. •VT-52 Terminal Emulation. •Duplex: Half, Full, Echo. •Set Begin Block/End Block for selected save and print functions •Browse/View through buffer. •Define margins, word-wrap, and justification for print-outs. •Complete support of the COCO's serial port and the RS232 Pack. •Optional prompted ASCII upload •Customize Colors to suit your display. **Much, Much More!**

**Cat. # 255MD** Disk only . . . . . . . . . . . . Introductory price . . . Just $49.95

# Just Got Better!

ANNOUNCING... **COLOR MAX DELUXE**©

In addition to the features and quality incorporated in the original Color Max 3, take a look at this partial list of impressive enhancements included in the new **COLOR MAX DELUXE:**

**EDIT MULTIPLE SCREENS - SIMUTANEOUSLY!**
**STRETCH & SHRINK** - ANY PROPORTION!
**ANIMATION - VARIABLE SPEED!**
**ROTATE** - ANY DEGREE!
**TILT!**
**SHADOW!**
**STAMP!**
**RAYS & ARCS!**
**MORE FONTS!**
**MORE STYLES!**
**MORE SPEED!**
**MORE POWER!**
**ALL PRINT DRIVERS INCLUDED!**
**COLOR CYCLING** - UP TO 16 COLORS!

**NEW DELUXE!**

COLOR MAX 3 AND DELUXE utilize the **STANDARD "MGE" format** for picture exchange. In addition, COLOR MAX uses the **STANDARD RADIO SHACK Hi-Res Interface - BEWARE OF LESSER QUALITY PROGRAMS EMPLOYING NON-STANDARD INTERFACES AS A FORM OF HARDWARE PROTECTION.**

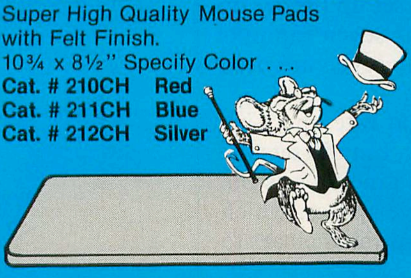
**COLOR MAX DELUXE** REQUIRES 512K RAM which provides for **SUPERIOR SPEED & POWER!**

Available for shipment AFTER October 1, 1987
**Cat. # 260MD** ........................ Introductory Price ... $69.95

Upgrade for Registered Owners Only ...
**Cat. # 261CC** ........................ (Send Original Disk) ... $15.00

**MOUSE PADS** ............ **$10.99 EA**
Super High Quality Mouse Pads
with Felt Finish.
10¾ x 8½" Specify Color ...

| | |
|---|---|
| **Cat. # 210CH** | **Red** |
| **Cat. # 211CH** | **Blue** |
| **Cat. # 212CH** | **Silver** |



**BLIP ART**© **BORDER PICTURE DISK**
20 border picture files for use with Graphicom II, CoCo Max, Hardcopy, Colorscan, or any program that can load standard 6K binary files. Helps create decorative signs, post cards, sale posters, etc. (May also be used with "Color Max 3" or "Color Max Deluxe" when used with "Picture Converter 1 - (Cat. # 220MD)".
**Cat. # 227WD** ................ **$19.95**

Print in Color! With **COLORSCAN,** easy to use software for the CGP-220 and your 64K CoCo (I, II, III). This program is a must for anyone who owns a Radio Shack Ink Jet Printer, and enjoys creating graphics with Graphicom, Graphicom Part II, CoCo MAX, or any other program that produces a standard 6K binary picture files.
**COLORSCAN** will print program listings in blazing color, Help create colorful banners over four feet in length, produce 1x1/2x2 or poster printout of your favorite 6K graphic disk files.
**Order Catalog# 184WD, See RAINBOW REVIEW (1/87 page 136)** ........ **$29.95**

**HARDCOPY** is more that just a screen print utility, compare these features with any other graphic dump program on the market: Gray Scale or B&W printouts, 1x1, 2x2, 3x3, Lables, posters, and greating cards with your graphics and much much more! **HARDCOPY** requires a 64K CoCo (I,II, or III) and disk drive. Please specify printer and catalog # when ordering.

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**HARDCOPY DISK See RAINBOW REVIEW (10/85) on page 218)** .................. **$29.95**

**Computize** INC.

VISA (215) 946-7260 P.O. BOX 207 • LANGHORNE, PA 19047 MasterCard
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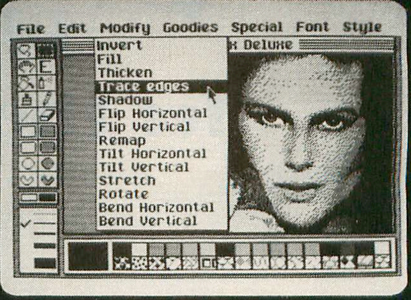
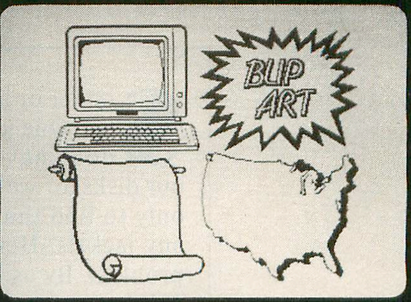
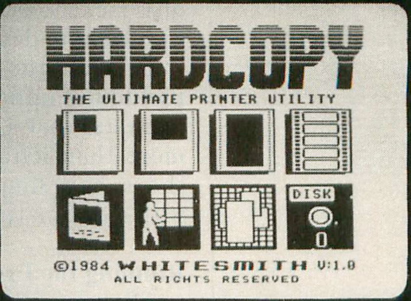
File Edit Modify Goodies Special Font Style
Color Max Deluxe


File Edit Modify Goodies Special Font Style
x Deluxe
Invert
Fill
Thicken
Trace edges
Shadow
Flip Horizontal
Flip Vertical
Remap
Tilt Horizontal
Tilt Vertical
Stretch
Rotate
Bend Horizontal
Bend Vertical

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THE ULTIMATE PRINTER UTILITY
DISK
©1984 WHITESMITH V:1.0
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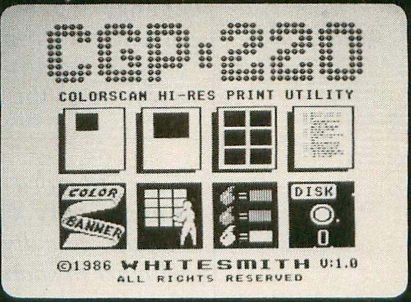
CGP-220
COLORSCAN HI-RES PRINT UTILITY
COLOR
BANNER
DISK
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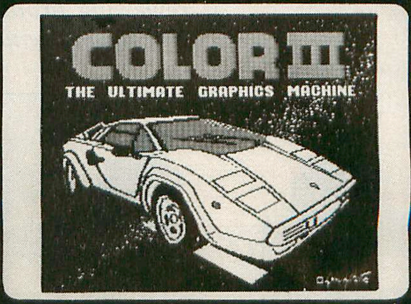
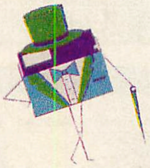

COLOR II
THE ULTIMATE GRAPHICS MACHINE



# Disk Jacket Designer for the Well-Dressed Diskette

## By Gay Crawford

Sooner or later, it happens to all of us. One day we notice that we don't have enough jackets for all our disks, or we buy those bargain disks only to find that they didn't come with any jackets. Here is the solution to the problem. By using *Jacket* and a Gemini 10X printer, you can print your own disk jackets, either plain or with your own custom design right on the front.

This unique program is not only useful, but informative as well. It demonstrates that a printer can be used for more than letters and listings, and it shows how simple it is to make things with a dot matrix printer.

**Running the Program**

All you need to do is load *Jacket* and change the baud rate in Line 30 to match your printer. Then run. Press Y (Yes) or N (No) when asked if you want a picture on the front. If you answer yes, then enter the picture's name and watch the printer go to work.

Remove the newly printed disk jacket, cut along the solid lines, fold along the dotted lines and tape or glue the ends together. It's that easy.

**How *Jacket* Works**

Lines 10 through 20 set up the array, storing the code for the seven top pins on the print head. Only seven are used with dot-matrix graphics.

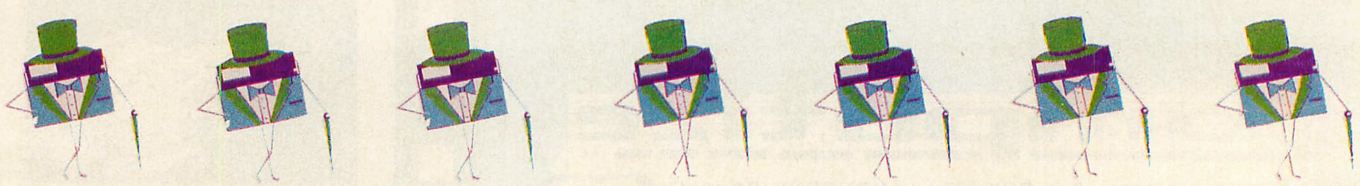
Line 30 sets the baud rate and Line 40 initializes the printer. Line 50 sets the line feed for 7/72 and Line 60 sets the left-hand margin in five spaces, which allows the jacket to be printed closer to the center of the page.

Lines 70 through 130 allow for a picture to be loaded to the screen and then dumped to the front of the jacket. Line 150 jumps to a subroutine that tells the printer how many dots to print across the page. This information must be sent after each carriage return.

Lines 160 through 280 send the codes to the printer, telling it which pins to "fire" and print the top edge of the jacket. For example, sending a `CHR$(64)` will fire the top pin, and doing this several times in a row will make a line across the page.

---

*Gay Crawford is the president of the Kansas City Color Computer Users Group. She lives in Olathe, Kansas, with her husband, Tom, and divides her time between caring for two daughters, reviewing products for* THE RAINBOW *and raising venus fly traps.*



## Software Bonanza Pak

A SPECTACULAR SOFTWARE BONANZA with the following 12 programs: CoCo Checker, Multi-Pak Crak, CoCo Screen Dump, Disk Utility 2.1, Spectrum Font Generator, Tape/Disk Utility, Fastdupe II, 64K Disk Utility, Spectrum DOS, Basic+, CoCo Calender & OS9-Solution (a $300 plus value) for only $99.95

## CoCo III Software Library

Create an instant library of Spectrum Projects TOP CoCoIII software! Get FONT BONANZA, FONT DISK #1, FKEYS III, C III GRAPHICS, CoCoIII UTILITIES and FASTDUPE II (a $150 plus value) for only $49.95

## CoCo III Utilities

Terrific utility programs for the Color Computer III! Includes a CoCoII to CoCoIII Converter, 32K Hi-Res screen saver, 40/80 Column Word Processor, RAM tester, DEMO BALL generator, SMOOTH Scrolling demos. 128K DISK $24.95 (see 8/87 Rainbow review)

## CoCo III Secrets Revealed

An introduction to the Color Computer III that compares the differences between the CoCoI/II and the NEW CoCoIII. Includes: GIME chip specs, CoCoII to CoCoIII converter and a 128/512K RAM test. "Offers some very good information to programmers." - Rainbow review 2/87 $19.95

## CoCo III Screen Dump

This is the program for HARDCOPY GRAPHICS for Radio Shack bit-image, dot-matrix printers (DMP-105, DMP-130, etc.) and Epson compatibles (Star Micronics, Panasonic, etc.). Will print HSCREEN 1-4 and PMODE 0-4. 16 patterns can be CUSTOMIZED for any color on the screen! 128K CoCoIII DISK $24.95

## Fkeys III

A productivity enhancement that gives you the capability to add twenty (20) predefined functions to the CoCoII by using the CTRL, F1 and F2 keys!! $24.95 "Get more from your keyboard with FKEYS III" - Rainbow review 4/87

## C III Graphics

A drawing program for the CoCoIII using the new ENHANCED graphic features: 320X192 graphics, 16 of any 64 colors, plus the ability to SAVE and LOAD 32K screens. "Paint pretty pictures on the CoCo3." - Rainbow review 12/86 $19.95

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## Mikey Dial

When used with any Hayes compatible modem and Deluxe Program Pak, adds to Mikeyterm 4.0 the ability to Autodial 22 numbers from a menu and load a set of 3 MACROS for each directory choice. Also EASY redial & changing of MODEM settings by command menu. $19.95 (see 12/86 Rainbow review)

## Spectrum Font Generator

Write files using any CoCo Word Processor (TW-64, EliteWord, etc.) and convert them to Highly Detailed character sets! Some of the character sets supported are Italics, Old English, Futuristic & Block! Character set editor included & supports most dot-matrix printers! $29.95

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Save time and design pro looking diagrams using a 480X540 pixel worksheet w/6 viewing windows. Over 30 electronic symbols w/10 definable symbols. (Even Logic gates & Multipin chips!) Print hard copy & save to disk. 64K DISK $29.95

## CoCo Checker

Something possibly wrong with your CoCo? CoCo Checker is the answer! Will test your ROMs, RAMs, Disk Drives & Controller, Printer, Keyboard, Cassette, Joysticks, Sound, PIAs, VDG, Internal Clock Speed, Multi-pak Interface and more! $24.95

## Rickeyterm 2.0

Supports 40/80 column mode, ASCII or XMODEM uploads & downloads, Deluxe RS232 PAK or Serial 'BITBANGER' port, 300/1200 Baud! Plus 'STRINGS' (predefined sequences of text) can be read into the BUFFER from DISK & transmitted by NAME! Type ahead & auto-repeat are also supported. 128K CoCoIII DISK $39.95 (see 9/87 Rainbow review)

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Take advantage of an expanded 64K machine. Make an additional 8K of RAM available by relocating the Ext Basic ROM from $8000 to $D800. Copy ROMPAKs to disk (even "protected" PAKs) and create a 32K SPOOL buffer for printing. $24.95

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## Blackjack Royale

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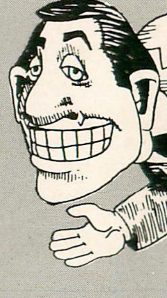

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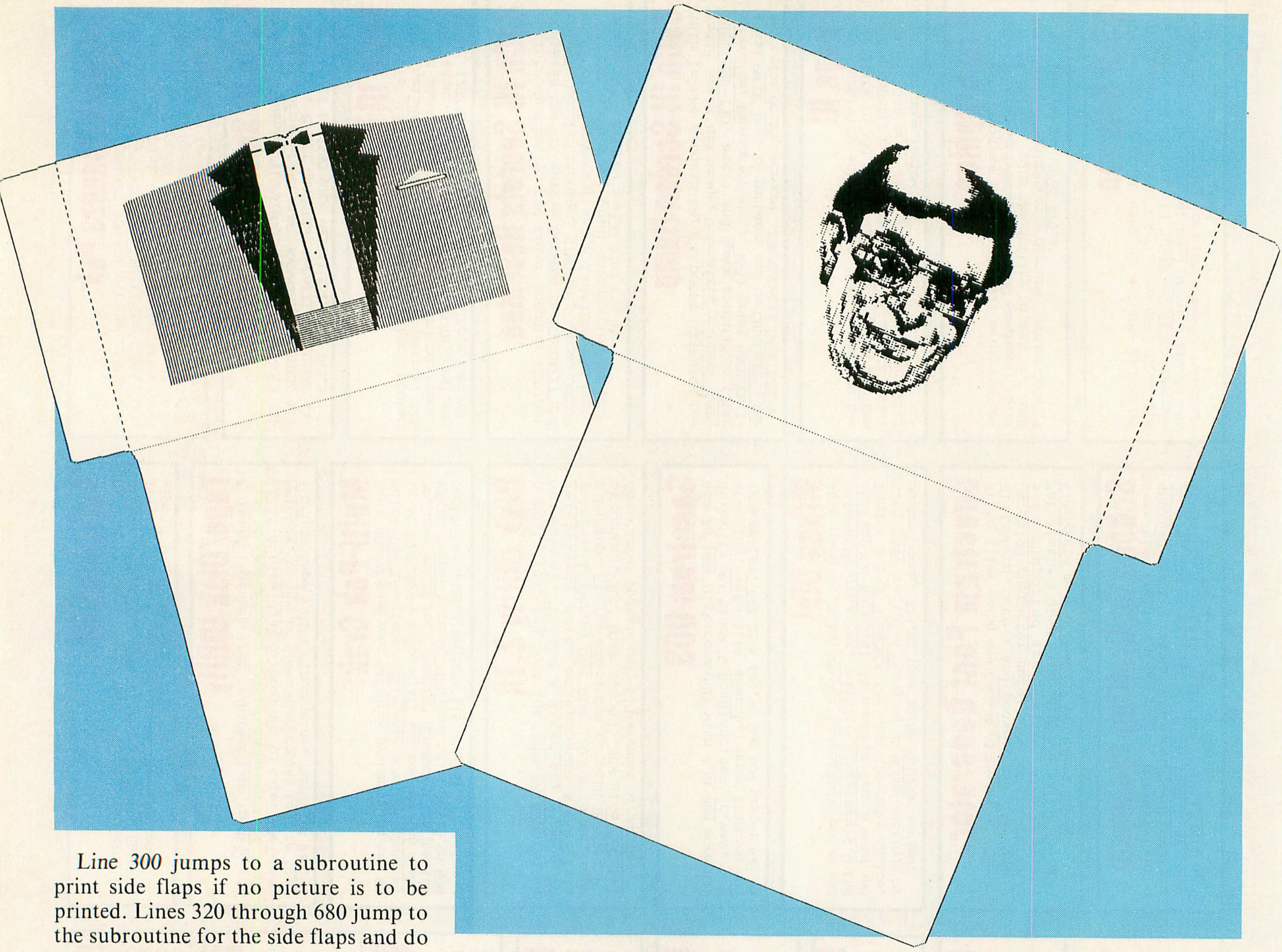

Line *300* jumps to a subroutine to print side flaps if no picture is to be printed. Lines 320 through 680 jump to the subroutine for the side flaps and do a screen dump on the front.

Lines 700 through 810 print the bottom fold. Lines 830 through 1010 print the back of the jacket.

Line 1020 sends a form-feed code to the printer. Line 1040 tells the printer to print 426 dots across and Line 1050 tells the printer to print 379 dots across.

Lines 1070 through 1160 are a subroutine that prints the side flaps for the front of the jacket. This is used for both a plain jacket as well as one with a picture on it.

Line 1170 contains the data for the individual print pins — 64 for the top pin and one for the bottom.

Since this is a BASIC program, it is rather slow. However, it would be easy to convert the program to work on other printers. After printing your customized jacket, you may want to make photocopies of the page. This will save wear and tear on your printer.

*(Questions about this program may be addressed to the author at 1001 Fredrickson, Olathe, KS 66061. Please enclose an SASE for a reply.)* □

*Editor's Note: Two sample picture files,* `LONNIE.BIN` *and* `TUXEDO.BIN` *will be included on this month's RAINBOW ON TAPE and RAINBOW ON DISK. Since this program requires disk, however, the pictures will be saved on RAINBOW ON TAPE with Disk BASIC addresses. To transfer each file to disk, just* `CLOADM` *the file and type* `SAVEM"filename",&H0E00,&H25FF,&HA027`

| | |
|---|---|
| 200 ......105 | 810 ......207 |
| 380 .......86 | 1000 .....105 |
| 640 .......53 | END ......51 |

**The listing:** `JACKET`

```
1 'disk jacket designer
2 'copyright (c) 1986
3 'GAY CRAWFORD
4 '1001 FREDRICKSON
5 'OLATHE, KS  66061
6 '
```

# SHOPPING LIST

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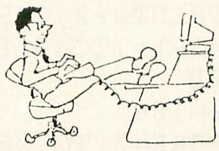
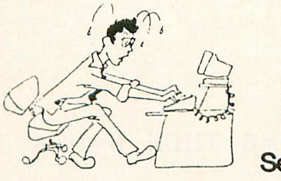
**Breaking your back typing on your CoCo???**





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**64K RAM CHIPS ~~$19.95~~ $12.95**

```
10 DIM A(7)
20 FORL=1 TO 7:READ A(L):NEXTL
30 POKE150,18' BAUD RATE 2400
40 PRINT#-2,CHR$(27);"@";CHR$(27
);"1";
50 PRINT#-2,CHR$(27);"1";
60 PRINT#-2,CHR$(27);CHR$(77);CH
R$(5);
70 CLS:PRINT"DO YOU WANT TO PRIN
T A PICTURE  ON THE SLEEVE?"
80 I$=INKEY$:IFI$=""THEN80
90 IFI$="N"THEN140
100 IFI$<>"Y"THEN80
110 CLS:LINEINPUT"ENTER NAME OF
PICTURE TO PRINT   ";P$
120 PMODE4,1:PCLS:SCREEN1,1
130 LOADMP$
140 'begin
150 GOSUB1040
160 PRINT#-2,CHR$(0);CHR$(1);
170 PRINT#-2,CHR$(2);CHR$(4);CHR
$(4);
180 FORL=1TO13:PRINT#-2,CHR$(8);
:NEXTL
190 FORL=1TO13:PRINT#-2,CHR$(16)
;:NEXTL
200 FORL=1TO13:PRINT#-2,CHR$(32)
;:NEXTL
210 PRINT#-2,CHR$(113);
```

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```
220 FORL=1TO336:PRINT#-2,CHR$(64
);:NEXTL
230 PRINT#-2,CHR$(113);
240 FORL=1TO13:PRINT#-2,CHR$(32)
;:NEXTL
250 FORL=1TO13:PRINT#-2,CHR$(16)
;:NEXTL
260 FORL=1TO13:PRINT#-2,CHR$(8);
:NEXTL
270 PRINT#-2,CHR$(4);CHR$(4);CHR
$(2);
280 PRINT#-2,CHR$(1);CHR$(0)
290 'print front
300 IF I$<>"Y" THEN F=39:GOSUB10
60:GOTO700
310 'read screen
320 F=3:GOSUB1060
330 FORY=0 TO 188 STEP7
340 GOSUB1040
350 PRINT#-2,CHR$(127);
360 FORL=1TO43:PRINT#-2,CHR$(0);
:NEXTL
370 PRINT#-2,CHR$(113);
380 FORL=1TO40:PRINT#-2,CHR$(0);
:NEXTL
390 FORX=0 TO 255
400 N=0
410 FORD=0 TO 7
420 IFPPOINT(X,Y+D)=0 THEN N=N+A
(D)
430 NEXTD
440 PRINT#-2,CHR$(N);
450 NEXTX
460 FORL=1TO40:PRINT#-2,CHR$(0);
:NEXTL
470 PRINT#-2,CHR$(113);
480 FORL=1TO43:PRINT#-2,CHR$(0);
:NEXTL
490 PRINT#-2,CHR$(127)
500 NEXTY
510 GOSUB1040
520 PRINT#-2,CHR$(127);
530 FORL=1TO43:PRINT#-2,CHR$(0);
:NEXTL
540 PRINT#-2,CHR$(113);
550 FORL=1TO40:PRINT#-2,CHR$(0);
:NEXTL
560 Y=189
570 FORX=0 TO 255
580 N=0
590 FORD=0 TO 2
600 IFPPOINT(X,Y+D)=0 THEN N=N+A
(D)
610 NEXTD
620 PRINT#-2,CHR$(N);
630 NEXTX
640 FORL=1TO40:PRINT#-2,CHR$(0);
:NEXTL
650 PRINT#-2,CHR$(113);
```

```
660 FORL=1TO43:PRINT#-2,CHR$(0);
:NEXTL
670 PRINT#-2,CHR$(127)
680 F=5:GOSUB1060
690 'bottom fold
700 GOSUB1040
710 PRINT#-2,CHR$(64);CHR$(32);C
HR$(16);CHR$(16);
720 FORL=1TO19:PRINT#-2,CHR$(8);
:NEXT
730 FORL=1TO18:PRINT#-2,CHR$(4);
:NEXT
740 PRINT#-2,CHR$(2);CHR$(2);CHR
$(2);
750 PRINT#-2,CHR$(113);
760 FORL=1TO168:PRINT#-2,CHR$(1)
;CHR$(0);:NEXT
770 PRINT#-2,CHR$(113);
780 PRINT#-2,CHR$(2);CHR$(2);CHR
$(2);
790 FORL=1TO18:PRINT#-2,CHR$(4);
:NEXT
800 FORL=1TO19:PRINT#-2,CHR$(8);
:NEXT
810 PRINT#-2,CHR$(16);CHR$(16);C
HR$(32);CHR$(64)
820 'print back
830 GOSUB1040
840 FORL=1TO45:PRINT#-2,CHR$(0);
:NEXT
850 PRINT#-2,CHR$(112);CHR$(15);
860 FORL=1TO332:PRINT#-2,CHR$(0)
;:NEXT
870 PRINT#-2,CHR$(15);CHR$(112);
880 FORL=1TO44:PRINT#-2,CHR$(0);
:NEXT
890 PRINT#-2,CHR$(0)
900 'back sides
910 FORC=1TO47:GOSUB1050
920 FORL=1TO47:PRINT#-2,CHR$(0);
:NEXTL
930 PRINT#-2,CHR$(127);
940 FORL=1TO330:PRINT#-2,CHR$(0)
;:NEXTL
950 PRINT#-2,CHR$(127)
960 NEXTC
970 GOSUB1050
980 FORL=1TO47:PRINT#-2,CHR$(0);
:NEXT
990 PRINT#-2,CHR$(64);CHR$(32);C
HR$(16);CHR$(8);CHR$(4);CHR$(2);
1000 FORL=1TO320:PRINT#-2,CHR$(1
);:NEXT
1010 PRINT#-2,CHR$(2);CHR$(4);CH
R$(8);CHR$(16);CHR$(32);CHR$(64)
1020 PRINT#-2,CHR$(12)
1030 STOP
1040 PRINT#-2,CHR$(27)"K"CHR$(17
0)CHR$(1);:RETURN
1050 PRINT#-2,CHR$(27)"K"CHR$(12
3)CHR$(1);:RETURN
1060 'front subroutine
1070 FORC=1TOF
1080 GOSUB1040
1090 PRINT#-2,CHR$(127);
1100 FORL=1TO43:PRINT#-2,CHR$(0)
;:NEXT
1110 PRINT#-2,CHR$(113);
1120 FORL=1TO336:PRINT#-2,CHR$(0
);:NEXT
1130 PRINT#-2,CHR$(113);
1140 FORL=1TO43:PRINT#-2,CHR$(0)
;:NEXT
1150 PRINT#-2,CHR$(127):NEXTC
1160 RETURN
1170 DATA 64,32,16,8,4,2,1
```

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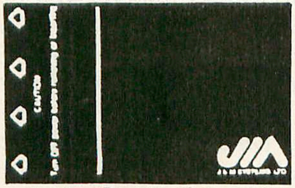

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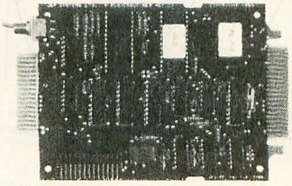

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| | |
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| | |
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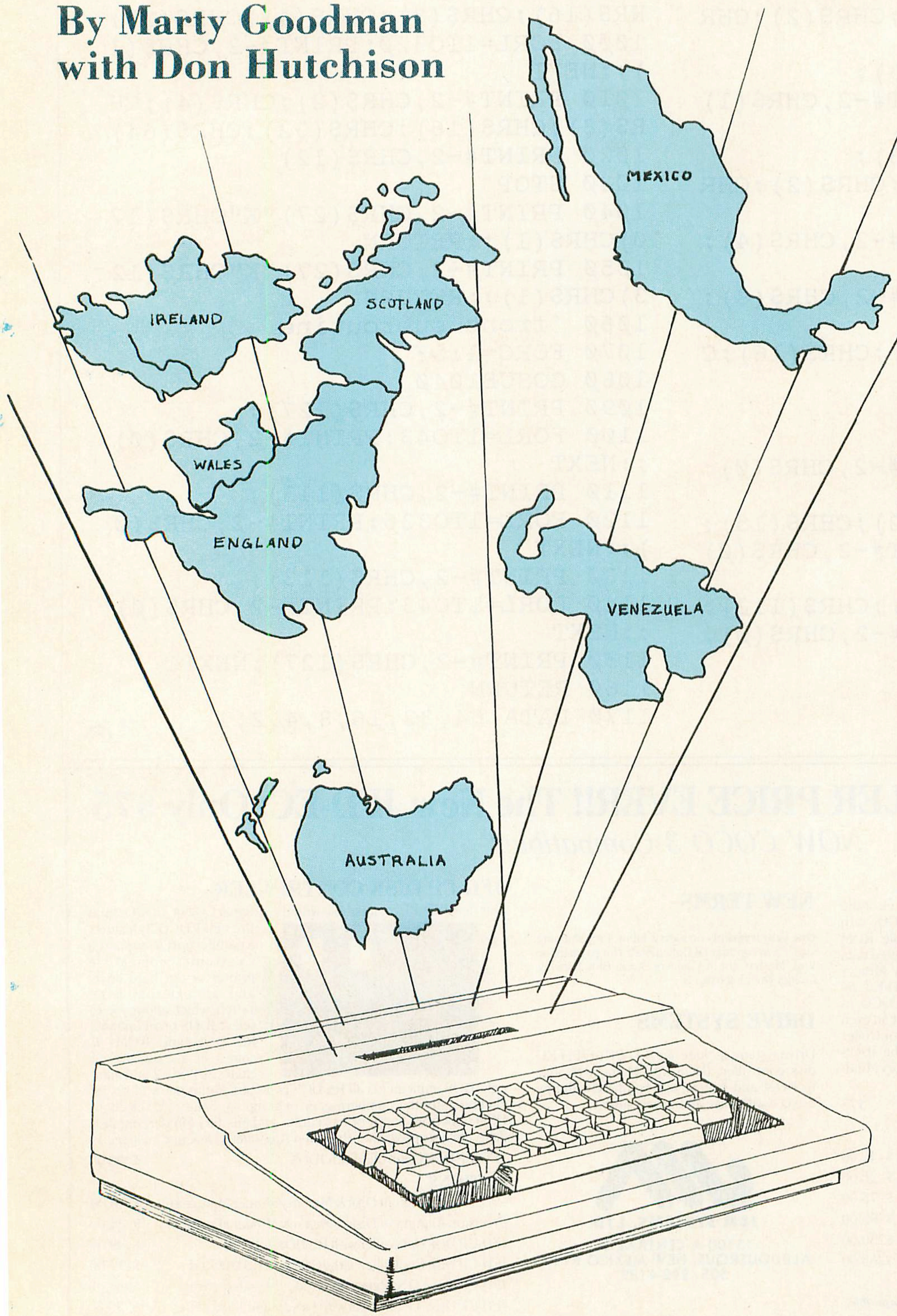
# CoCoing Abroad

### By Marty Goodman with Don Hutchison



Periodically on Delphi, we find folks asking us about taking a CoCo abroad. Their questions usually concern one or more of three general types of problems that people face when they take their computer systems to other countries. Note that the problems and their solutions may well be relevant to owners of any computer.

**Q.** *Will foreign televisions work with my CoCo when I take it abroad? How about foreign monitors?*

**A.** Sometimes yes, sometimes no. The answer depends on whether or not the country you're visiting uses the U.S.

---

*Martin H. Goodman, M.D., a physician trained in anesthesiology, is a longtime electronics tinkerer and outspoken commentator — sort of the Howard Cosell of the CoCo world. On Delphi, Marty is the SIGop of RAINBOW's CoCo SIG and database manager of OS-9 Online. His non-computer passions include running, mountaineering and outdoor photography. Marty lives in San Pablo, California.*

*Don Hutchison is an electrical engineer and lives in Atlanta, Georgia. He works as a senior project engineer involved in the design of industrial control systems. On Delphi, Don is the Database Manager of the RAINBOW CoCo SIG. His Delphi username is DONHUTCHISON.*

NTSC system. Canada, Mexico and most countries in Latin America use NTSC (as does Japan, on different VHF channel frequencies), but most other nations do not, preferring instead to use either the PAL or SECAM system. Their TVs cannot be connected to a CoCo built for use in North America.

Indeed, Tandy makes a separate model CoCo for use with PAL-type televisions. The difference between the NTSC and PAL models involves the different ways color information is added to a black-and-white TV signal. Monochrome composite monitors may be available abroad, for there are a number of computers using them, but color composite monitors may be harder to come by.

**Q.** *What sort of problems will I have operating my CoCo from foreign power sources?*

**A.** The problems are many and varied and depend on where abroad you go. However, there are three major sorts of power supply problems: voltage, frequency, and "cleanliness" of the power.

In the United States, our equipment operates on standard, stable voltages between 110 to 125 volts (usually 117 to 120) AC at a frequency of 60 cycles per second. Most foreign power sources supply 220 volts only, so some form of converter will be necessary to run your equipment abroad.

Another voltage-related problem is that the line voltage in some countries is not as closely regulated as it is in the U.S. Thus, "220 volts" could mean voltages varying constantly between 150 and 250 volts.

Grounding standards abroad differ considerably from U.S. standards. In many states, it is required by law that *metal* piping be used for 10 feet before the water pipe enters the home, and for at least one foot after it enters the foundation. This is purely for grounding purposes, since a buried copper pipe provides a very good ground.

Different countries also have different standards regarding the connection of a "neutral" supplied from the utility feed. Most U.S. utility companies connect the neutral side of the line to the ground connection inside the breaker panel. Many foreign standards do not require the connection of a neutral at all, and this may result in hazardous conditions for the computer operator and/or damage to the computer equipment.

Power in some countries is supplied at 50 cycles per second instead of 60. Unlike converters that turn 220 volts into 110 volts, and are widely available and relatively inexpensive, converters for turning 50 cycles to 60 are extremely unusual and quite expensive.

The frequency of the AC power is not important to the CoCo's clock frequency because that frequency is derived from an internal, crystal-controlled oscillator. However, the transformer in the CoCo that converts the incoming 117 volts AC to about 8 volts AC becomes less efficient as the frequency of the incoming current decreases. The difference between 60 and 50 cycles could, in some cases, cause the transformer to run abnormally hot, and result in ultimate overheating and malfunctioning. Whether or not a given CoCo is sensitve to 50-cycle AC at 110 volts can be difficult to predict. We've heard reports of some CoCos working fine on 50-cycle AC, and of others overheating. The issue is very likely one of subtle variations in the power supply and current drain of different model CoCos.

Finally, power in other countries is generally "dirtier" than power in the United States. That is, there may be more spikes, surges, and brown- or blackouts, especially behind the Iron Curtain, where voltage fluctuations are frequent. It is not at all uncommon to see voltage spikes of 150 volts or more! This is certainly not conducive to long equipment life. Monitors, in particular,

# Monitor Updates

## By Marty Goodman

In the August '87 RAINBOW I wrote an article describing how to make a cable to hook a Magnavox RGB monitor to CoCo 3's RGB port (see "A Guide to RGB Analog Monitors," Page 68). Since then I have learned a bit more about the matter, received information from others, and noted one or two minor errors in the article as printed. The following is intended to correct those errors and provide the additional information I have learned.

### The Sony KV1311CR Cable

In my article I said you could find a source of +5 volts on Pin 14 of the 14-pin IC or Pin 16 of the 16-pin IC near the 34-pin RGB analog connector. It would have been more correct for me to have written that those two ICs are actually located nearer to the 8-pin RGB digital connector than they are to the 34-pin RGB analog connector on the Sony KV1311CR vertical circuit board.

Also in that article I suggested "stealing" a source of +5 volts for running the Sony cable from the joystick connector. This will properly power the needed chip, but stealing power from that joystick connector will result in the joysticks ceasing to work correctly — they no longer produce a full range of values when you move them. This problem can be fixed by shorting out R13 inside the CoCo 3. R13 is a 100-ohm (brown-black-brown), ½ watt (slightly fatter than the other resistors) resistor located to the right of the rearmost of the four socketed 4464 memory chips on the CoCo 3's motherboard.

But once you have the computer open, it would be better to steal 5 volts directly from somewhere inside the computer and leave the joystick ports alone. The +5 volts can be obtained from hundreds of points on the CoCo motherboard, including one spot just in front of the MC68B09EP chip near the 40-pin connector. This spot is actually labeled +5 volts, and the pad you need to solder to is indicated with a white, silk-screen circle.

Still on the subject of Sony cables, note that I neglected to mention in my article that Spectro Systems is also a vendor of Sony KV1311CR to CoCo RGB cables, along with Spectrum Projects. Note, too, that not only is Howard Medical selling Sony KV1311CR monitors with CoCo 3 cables, but the monitors they are selling are specially modified so that they can work with a particularly simple RGB cable that requires no joystick connector. This cable has been custom-built for them.

### The Amiga 1080 Monitor

In my article I speculated that the Amiga 1080 monitor could be made to work with a CoCo 3 if the sync signals were combined and inverted. I have since successfully constructed a working CoCo 3 to Amiga 1080 cable, and the image is reported to be quite nice. Note, also, that the Sony KV1311CR monitor works fine with Amiga computers and is a popular

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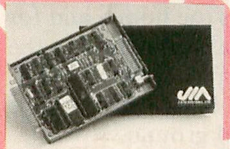

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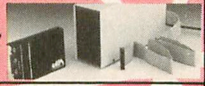

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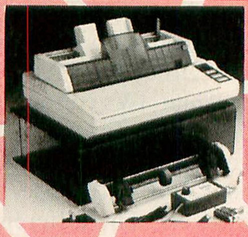

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Signature ____________ Card Expiration Date ______ are very sensitive to power line voltage fluctuations.

Simple spike filters ($40 to $100) often will take care of the spikes. But for substantial surges or brownouts, power conditioners ($200 to $400) are needed, and for blackouts, uninterruptable power supplies ($300 to $1,000 and up) are often required.

**Q.** *What about telecommunication abroad?*

**A.** In the United States, when we communicate at 300 or 1200 bits per second over telephone lines, we use the Bell 103 or Bell 212A standard for encoding the data. This standard is *not* used in Europe. Instead, they use a *completely different* type of encoding for both 300 and 1200 bps, established by the CCITT (International Telegraph and Telephone Consultative Committee).

In most European countries, use of modems is heavily regulated. Attempts to use a Bell 103 or 212A type modem may be quite illegal. Indeed, I've been told that using an American Bell-standard modem in some countries causes odd effects on the telephone system because the modem tones and some telephone system control tones are on the same frequency.

Some of the more modern modems sold in America today do have provisions for operating in the CCITT standard at 300 and 1200 bps. This must be explicitly stated in the instructions for the modem. 2400 bps modems used both here and in Europe operate on the *same* 2400 bps CCITT standard.

Apart from problems of protocol, other problems can arise. These include line noise, periodic interruptions of service and the like. There may also be problems relating to physically hooking into the telephone lines to attach a direct-connect modem. I've heard of problems caused by odd-shaped and odd-sized telephone apparatus that plagued users of acoustic cup modems abroad. It's best to take small screwdrivers and a patch cord that hooks to your modem at one end and has alligator clips at the other end in order to make sure you can connect to the telephone you encounter.

Before you travel with your computer, you'll need to do a thorough study of what special conditions you may face. Hopefully, this article will give you an idea of what questions to ask.

choice among Amiga owners. The RGB video used by the Amiga is similar to that of the CoCo.

**The Magnavox 8CM562**

Ken Piccoli of Rochester, New York, wrote to point out that the Magnavox 8CM562 can display an image without using any special adapter circuitry. Merely wire the analog RGB of the CoCo 3 to the digital RGB port it offers. Using an 8-pin DIN connector to make the cable, he wired R to R, G to G, B to B, Hsync to Hsync, Vsync to Vsync, and ground to ground, and was able to get an image. (He ignored the Intensity pin on the Magnavox and left it unconnected.) Mr. Piccoli is probably incorrect, however, when he alleged that this allowed the Magnavox monitor to "work great." With this arrangement, the best you can do is display up to six colors plus black-and-white, because its RGB I port was not designed to accept an analog RGB signal. Thus, the arrangement is virtually worthless for display of CoCo 3 graphic art in full color, although it is quite acceptable for bringing up an 80-column text screen. If you are going out to buy a Magnavox monitor, *do not buy* the Magnavox 8CM562! But, if you have access to one, you may be able to use it for text display with the CoCo 3.

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# Plumbing For Your CoCo

### By Ronald Pettus

Shopping for computer equipment in a hardware store may seem ridiculous, but if you need a monitor or printer stand, the idea is not as outrageous as it first sounds. Using about $4 worth of materials, one tool and a scrap of sandpaper, you can build an attractive, functional stand.

Plastic pipe is the secret to this 20-minute hardware project, and it offers many advantages. The pipe, or PVC pipe, to be specific, is available at hardware stores and can be cut with a handsaw or hacksaw.

A few feet of pipe, a handful of pipe fittings and four furniture-leg end caps are all you need. The fittings provide such a tight fit that glue is not required, but you get a more permanent and sturdy result if PVC adhesive is applied to each connection.

A pleasant extra benefit is the pipe's beige color, which matches the CoCo 2 and many popular monitors and printers. In addition, the stand provides access to the back of the computer and the ROM port, while giving plenty of ventilation to your CoCo.

Figure 1 illustrates the general layout of a simple stand for monitors or printers. PVC ½-inch pipe adequately supports 12-inch monitors, most printers and even 13-inch color television sets. If you want a stronger structure, the pipe also comes in a ¾-inch size.

The biggest decision is the size of the stand. The typical measurements for a 12-inch monitor stand are listed, but it is a simple matter to modify these dimensions if you want to customize your project.

A tilted printer stand with a catch tray for printouts can be built for about $8. The tray is a standard 8½-by-12-inch letter tray available in assorted colors from discount department stores. The design details for the printer stand are shown in Figure 2 which provides measurements for an Epson FX-80 printer; other dimensions may be required for different printers.

Here are a few construction hints that may prove useful. Cutting the pipe with a handsaw or hacksaw leaves a burr, which should be removed with sandpaper or a file. The pipe also has red markings stamped down its length. These markings can be eliminated with light sanding. *Completely assemble the stand before using glue.*

To assemble the monitor stand, at-

---

*Ron Pettus works in the field of operations analysis and holds a degree in physics. His hobbies include astronomy and volunteer work at a science museum. Ron's last RAINBOW contribution was a program to locate Halley's Comet.*

tach the cross bars (D) to the tees, one tee at each end. Next, make a square by connecting the cross bars with the side bars (C). Finally, add piece B, a 90-degree elbow and piece A at each corner to make legs. A ⅝-inch vinyl furniture tip fits over the bottom end of each leg.

The tilted printer stand is assembled similarly with the tray resting on four short pieces (J). If the monitor or printer slides on the stand, add self-sticking foam strips to the tee fittings.

Press the fixtures tight and square the components. Do not glue the joints until you make sure everything is as you want it. Then glue one joint at a time.

*(Questions or comments about this project may be addressed to the author at 1228 Fordyce Lane, St. Charles, MO 63303. Please enclose an SASE when requesting a reply.)* ☐

## Monitor/Printer Stand

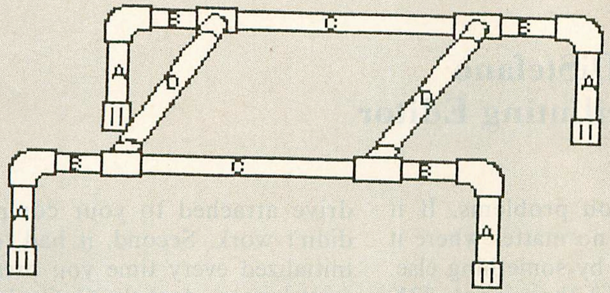

Figure 1

**List of Material — ½-inch PVC Pipe**

- 90-degree Elbow (4)
- Tee Fitting (4)
- Vinyl Furniture Tips — ⅝" size (4)
- Beige PVC Pipe (approx. 5 feet)

| Pipe | Length (inches) | Qty |
|---|---|---|
| A | 3½ | 4 |
| B | 2 | 4 |
| C | 9 | 2 |
| D | 7 | 2 |

## FX-80 Printer Stand with Catch Tray

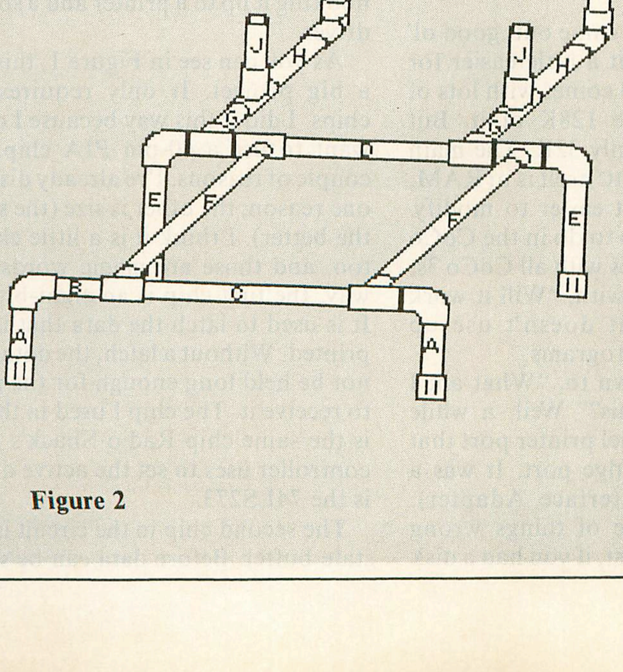

Figure 2

**List of Material — ½-inch PVC Pipe**

- 90-degree Elbow (6)
- Tee Fitting (8)
- Vinyl Furniture Tips — ⅝" size (4)
- Beige PVC Pipe (approx. 8 feet)
- Letter Tray — 8½" x 12" (1)

| Pipe | Length (inches) | Qty |
|---|---|---|
| A | 2½ | 2 |
| B | 3 | 1 |
| C | 10 | 1 |
| D | 8 | 1 |
| E | 3½ | 2 |
| F | 9 | 2 |
| G | 2 | 2 |
| H | 6 | 2 |
| J | 4 | 4 |
| not shown | 1 | 5 |

# A New, Improved Printer Adapter

**By Tony DiStefano**
**Rainbow Contributing Editor**

I have watched our computer grow from a 4K CoCo 1 to a 512K CoCo 3. BASIC has improved from ho-hum simple Color BASIC to Extended Color BASIC, to Disk Extended Color BASIC. That is some improvement. The hardware has gotten faster and the software has gotten better. There is, and always will be, a close relationship between software and hardware. It's a closed loop. The hardware cannot work without the software and the software cannot work without the hardware. This is where I sometimes have a dilemma. I have many ideas for hardware, yet do not have the time or the skill to implement the proper software.

DOS (Disk Operating System) or, for that matter, any software in ROM (Read Only Memory) is a lot harder to deal with than software in RAM (Random Access Memory). This is because ROM cannot be changed, but RAM can be. So, if there's a little piece of hardware you want to add on, it must be supported by software. To add on some hardware, you can plug it into the cartridge slot or you can plug it into a multipack. If you are like me, you can also solder it right in. All you need is the hardware.

The software, on the other hand, can be loaded from cassette or disk, or typed in from the keyboard (if it is not too long). But, whatever the method, software may cause you problems. If it resides in memory, no matter where it is, it will be erased by something else. In the CoCo 1, 2 and 3, there is only 32K of memory available for BASIC programs. The other 32K is reserved for BASIC itself. In the case of the CoCo 1 and 2, this 32K of memory space is taken up by ROMs.

If, for example, you want to make changes to BASIC, you need to have 64K of memory. Then you need a routine to transfer ROM into RAM. Only then can you make changes to BASIC. For instance, if you don't like the word `PRINT` you can change it to `SPLAT`. If you want to change a routine, it can be done. Of course, you will need some knowledge of how BASIC works. But the fact is you can do it.

When the CoCo 3 came out, good ol' Radio Shack made it a little easier for us. First, the CoCo 3 comes with lots of memory — a whole 128K of it. But BASIC can still use only 32K. The main difference is that BASIC itself is in RAM, which makes it a lot easier to modify. There is one less step to do in the CoCo 3. Also, since it comes with all CoCo 3s, there is no problem with, "Will it work with mine?" And it doesn't use up memory for BASIC programs.

Now it comes down to, "What am I going to do with this?" Well, a while back, I made a parallel printer port that plugs into the cartridge port. It was a PIA (Peripheral Interface Adapter). There were a couple of things wrong with this adapter. First, if you had a disk drive attached to your computer, it didn't work. Second, it had to be reinitialized every time you pressed the reset button. And the CoCo 3 was not available then, so you needed driver software, which was always in the wrong place.

This time I am making a new parallel printer adapter — a better one, in many ways. First, it will be inside the CoCo. Second, since I am not using a PIA, it will not be necessary to re-initialize after a reset. And, if you are installing it in the CoCo 3, which always works in the all-RAM mode, the driver will not be erased by other software. The rest of this month's article will be taken up by the construction of the adapter board itself, and next month we'll finish by hooking it up to a printer and a software driver.

As you can see in Figure 1, this is not a big project. It only requires three chips. I did it this way because I did not want to use a 40-pin PIA chip, for a couple of reasons. I've already discussed one reason; the other is size (the smaller the better). I think it is a little cheaper, too, and those are magic words. Anyway, the first chip is an eight-bit latch. It is used to latch the data that is to be printed. Without a latch, the data would not be held long enough for the printer to receive it. The chip I used in this case is the same chip Radio Shack's newest controller uses to set the active drive. It is the 74LS273.

The second chip in the circuit is a tristate buffer. Before data can be sent to

---

*Tony DiStefano is a well-known early specialist in computer hardware projects. He lives in Laval Ouest, Quebec.*

a printer, it is up to the software driver to determine that the printer is not busy. This is done with software that reads the busy line on the printer. The second chip in the circuit is connected to the busy line of the printer. The output of this buffer is connected to Bit 7 of the data bus. When a READ to that memory location is done, the status of the printer is easily known. The chip in question is a 74LS125.

The third chip in the circuit is very important. It is used to memory map the printer data latch and the busy indicator into the picture. The chip I used for this is a 74LS139. It is a dual 2-to-4 decoder. Memory mapping extra devices into the CoCo's memory area is a very delicate operation. There are not very many locations available that don't violate someone's real estate.

But, I have a trick up my sleeve. The I/O area used for the disk drive hardware is mapped from $FF40 (65344) to $FF5F (65375). That area takes up 32 bytes. You need only five of those 32 bytes to operate the disk drive. The other bytes are wasted because they are mirrored. "Mirrored" means you access more than one byte but get the same hardware being activated. In the case of the CoCo's map, the five bytes are all located between $FF40 and $FF4F (65359). The first thing this chip does is separate the upper half of the I/O area from the lower half. This is done using half of the 74LS139. It separates the SCS line into two sections. The first section, $FF40 to $FF4F, will go to the disk controller. That is needed if you are to use a disk drive. We will use the second section for the printer I/O.

The second half of this chip is used to further decode the section into two more sections. The first of the two sections is used for data. This signal is also used to strobe the data into the printer. This is done by running a line from this output to the Strobe input of the printer. The second section is used for the busy line. It is used to activate one of the tri-state buffers of the 74LS125. The other buffers of this chip are not used.

To recap, the new memory map looks like this: The untouched area is from $FF40 to $FF4F. This area has to go to the disk drive. The next area is $FF50, which is used for the data latch. Finally, the third area is $FF58, and it is used to monitor the busy signal.

Constructing this board is not a big deal. You will need the three chips mentioned above. It is recommended that you use sockets for the chips (a 20-, a 16- and a 14-pin socket). You will also need a small board to mount the chips on. The way I decided to put it in, the PCB will not need an EDGE connector. A 2-inch by 3-inch board is more than enough to fit all the parts on. Radio Shack has such a board.

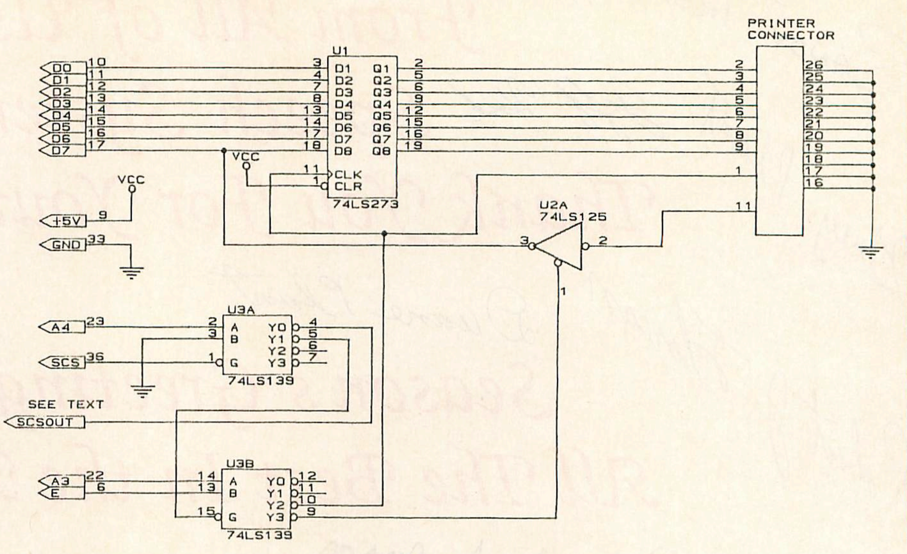

Figure 1

As usual, there is more than one way to skin a cat. Some may like to solder directly, and some may prefer to use connectors. This time I'll use a connector for the output and direct wiring for the input. As a connector for the output, I used a dual in-line header. This is a connector that has two rows of pins that are spaced at one-tenth inches between the rows and at one-tenth inches between the pins. You will need a 26-pin connector.

The connector should mount on the same side as the components. It is numbered as follows. Look at the pins lengthwise. Pin 1 is the bottom left-hand pin. Continue counting counterclockwise till you get them all. See Figure 2 for its position. All pins not mentioned are N/C. The construction of the board is simple and requires only the standard project kit. In Figure 1 the 5 volts and ground pins are not indicated. The following is a list of the 5 volts and ground connections:

| IC | +5 Volts | GND |
|---|---|---|
| 74LS273 | 20 | 10 |
| 74LS125 | 14 | 7 |
| 74LS139 | 16 | 8 |

Also not shown on the schematic are three decoupling capacitors. The value of the caps is one-tenth uf at 25 volts. They go between +5 volts and ground, and as close to the chips as possible. These caps are used to decouple the supply to the chips. There is one more thing to do. Since the SCS line has to be decoded to a different state, it has to be cut. The best place to cut the line is right at the connector. In fact, that is the best place to get all of the signals — right at the connector. Use the connector numbers, but solder the wires directly to the connector on the inside.

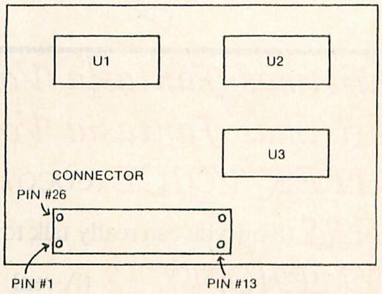

Figure 2

Cut the connector and pry the two ends apart so they do not touch. The end that goes to the connector is the SCSOUT and the side that goes to the PCB is the SCS. Build the circuit first, then connect the wires to the connector. Make the wires as short as possible so that they won't be in the way of anything. Use four plastic screws and some rubber cement to fix the board to the computer.

Next month I'll finish up by making and installing the printer cable and getting the different drivers for CoCos 1, 2 and 3.

Sandy Trevor

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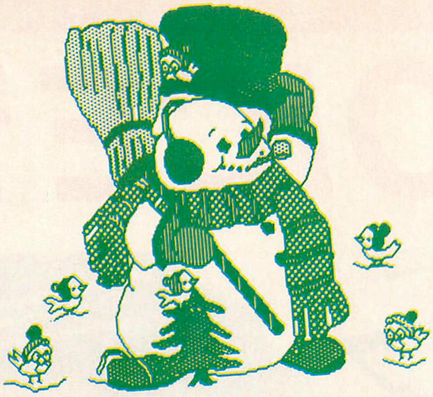

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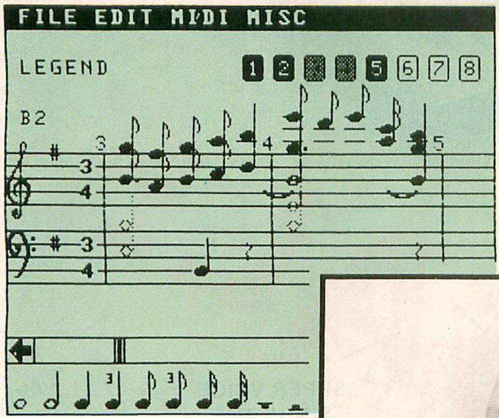

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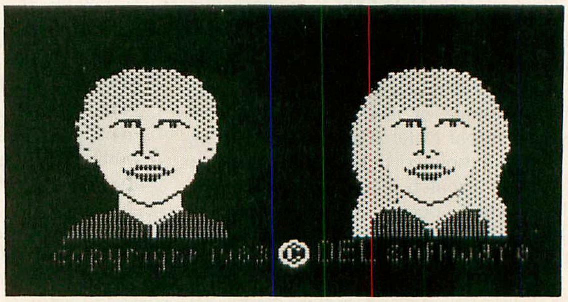

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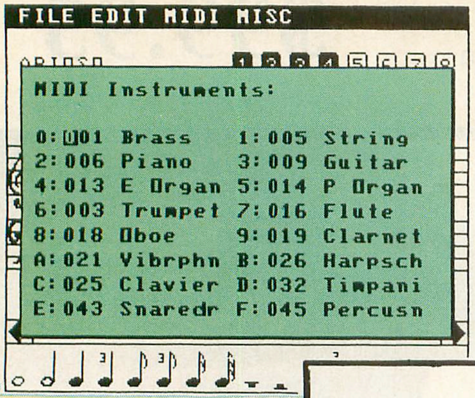

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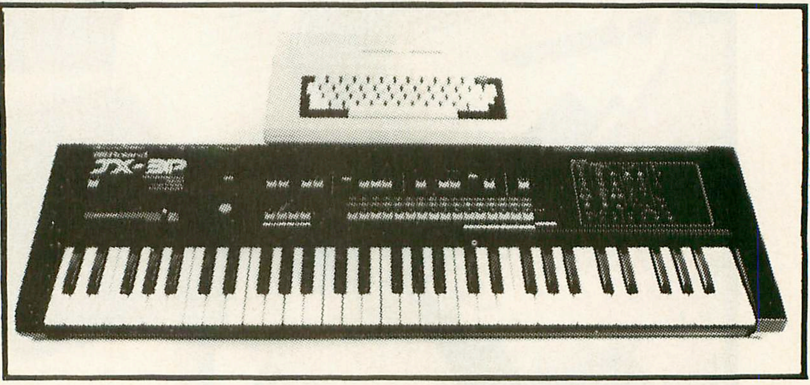

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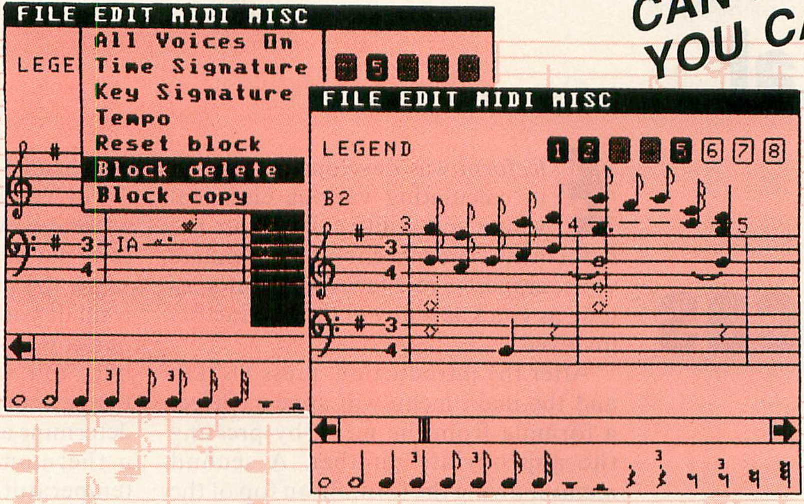

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- Compose with up to 8 completely independent voices.
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  - Note delete
  - Note change
  - Block insert
  - Block delete
  - Block copy
- Output music to:
  - TV Speaker
  - STEREO PAK
  - SYMPHONY 12
  - MIDI Synth
  - Monitor Speaker
  - ORCHESTRA 90
  - COCO MIDI S/E
  - MIDI Drum Machine
- Output up to 4 voices without additional hardware.
- Output all 8 voices using either SYMPHONY 12 or one or more MIDI synthesizers and drum machines.
- Output any voice on any of the 8 MIDI channels.
- Transpose music to any key.
- Modify music to any tempo.
- Automatically inserts bar for each measure as you compose.
- Key signature lets you specify sharps and flats only once, LYRA will do the rest.
- Plays MUSICA 2 files using LYRA CONVERT (#LC164).
- Each voice may be visually highlighted or erased.
- Each measure is numbered for easy reading.
- Solo capability
- Block edits are highlighted.
- Tie notes together for musical continuity.
- Name of note pointed to is constantly displayed.
- Jump to any point in the score instantaneously.
- Memory remaining clearly displayed, however you will have plenty of memory even for the most demanding piece.
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- Music easily saved to tape or disk.
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# WATTS the Electrical Cost of Appliances

### By Kenneth Burdon

*Elecform* was developed as an aid in calculating various electrical values and utility costs. From the main menu, you can choose to calculate volts, amperes, resistance and watts, as long as you know any of the two factors involved.

After the introduction, press ENTER, and the main menu will appear. Select a formula from the menu by pressing the appropriate number. A second menu showing the formula on top of the screen will appear, and you will be asked to enter the known values in succession. The computer then calculates the formula and prints the answer on the screen. After any calculation you may either return to the main menu or end the program.

At the bottom of the screen for watt calculation you are given the option of calculating the cost of heating water electrically, or the cost of any appliance.

For calculating the cost of heating water, you will need to know your local rate per kilowatt-hour. If you don't know the rate, estimate by dividing the total of your electric bill by the number of kilowatts consumed, as shown on the bill. You will also need to know the temperature of the incoming water — determine at any cold water faucet using a thermometer. For outgoing water temperature, use something like 150 degrees Fahrenheit for dishwashers and about 105 degrees Fahrenheit for baths, etc. You have to estimate the amount of water used; most clothes and dishwashers use about 50 gallons for a complete cycle, but all the water they use is not necessarily hot.

You are also given a chance to calculate the cost of any electrical appliance such as a hair dryer, can opener, toaster, etc. Don't forget that air conditioner. All approved appliances will have a tag that lists the amperes they draw. A voltage of 120 is pretty much standard in this country, although it may vary from time to time depending on the overall load and efficiency of your power company. ☐

---

*Ken Burdon is semi-retired, and is currently running his own consulting business in Industrial Lubrication. He has been writing programs for his CoCo for several years, in connection with his work.*

|  |  |  |  |
|---|---|---|---|
| 75 | 199 | 475 | 165 |
| 175 | 210 | 590 | 190 |
| 295 | 217 | 675 | 18 |
| 380 | 107 | END | 96 |

**The listing:** ELECFORM

```
1 CLS
2 PRINT@73,"KEN BURDON"
3 PRINT@102,"201 OAKRIDGE ROAD"
4 PRINT@134,"PLAISTOW, NH-03865"
5 PRINT@166,"COPYRIGHT 1987"
6 PRINT@228,"PRESS<ENTER> TO PRO
CEED"
```

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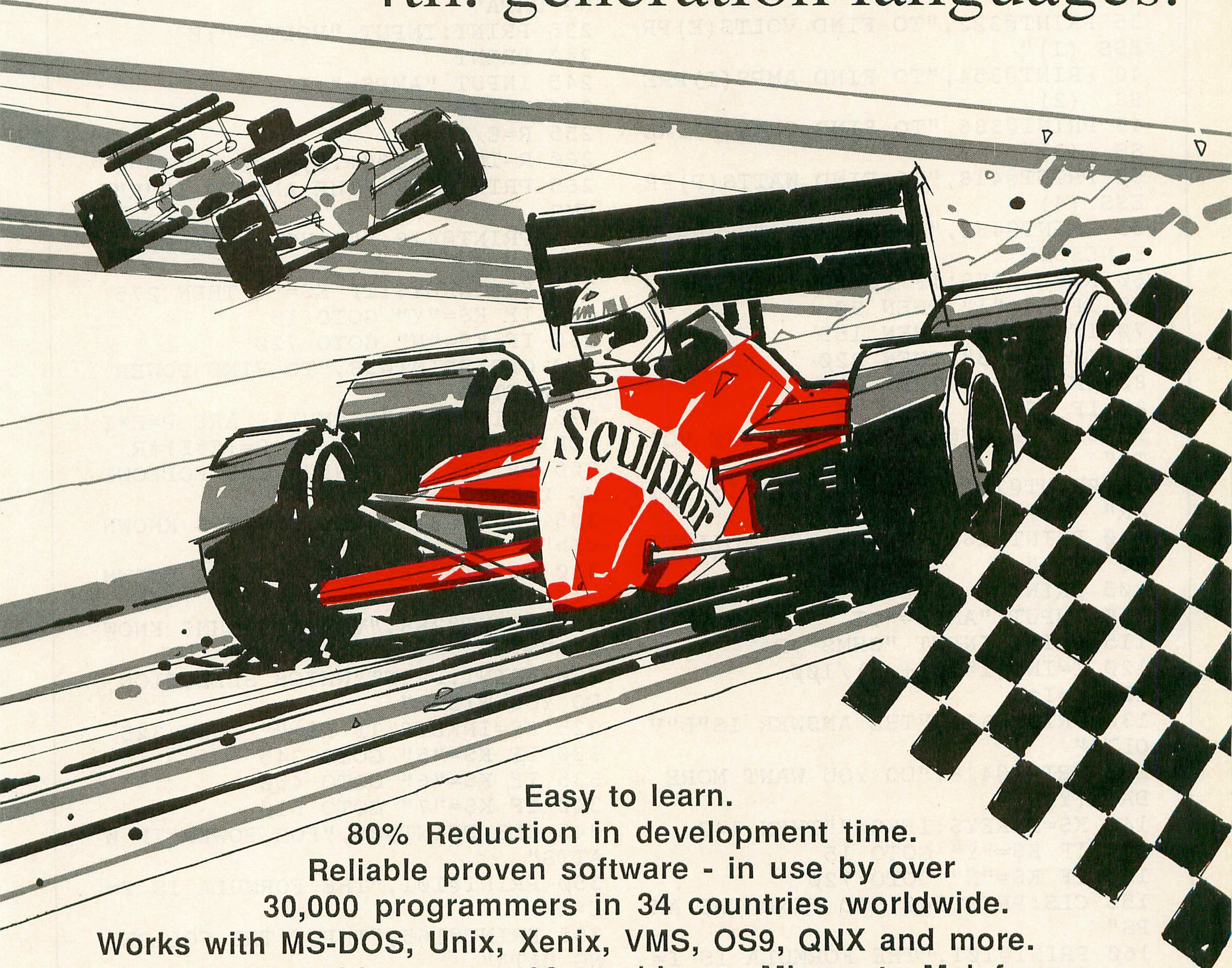

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```
8 AN$=INKEY$:IF AN$="" THEN 8
9 IF AN$=CHR$(13) THEN 10
10 DIM E(100),I(100),R(100),P(30
0),C(300)
15 CLS
20 PRINT@101,"ELECTRICAL FORMULA
S"
25 PRINT@167,"VALUES NEEDED"
30 PRINT@196,"2 OF 3 MUST BE KNO
WN"
35 PRINT@322,"TO FIND VOLTS(E)PR
ESS (1)"
40 PRINT@354,"TO FIND AMPS(I)PRE
SS  (2)
45 PRINT@386,"TO FIND OHMS(R)PRE
SS  (3)"
50 PRINT@418,"TO FIND WATTS(P)PR
ESS (4)
55 PRINT@482,"TO SELECT THE VALU
E NEEDED        PRESS (1-4)"
60 K$=INKEY$:IF K$="" THEN 60
65 IF K$="1" THEN 90
70 IF K$="2" THEN 155
75 IF K$="3" THEN 220
80 IF K$="4" THEN 290
85 IF K$>"4" THEN 15
90 CLS:PRINT@40,"TO FIND THE VOL
TS"
95 PRINT@101,"THE FORMULA IS E=I
*R"
100 PRINT@165,"INPUT THE FOLLOWI
NG DATA"
105 PRINT
110 INPUT "AMPS=";I
115 PRINT:INPUT "OHMS";R
120 I=INT(I*100+.5)/100
125 E=I*R
130 PRINT@322,"THE ANSWER IS"E"V
OLTS"
135 PRINT@418,"DO YOU WANT MORE
DATA(Y,N)"
140 K$=INKEY$:IFK$=""THEN 140
145 IF K$="Y" GOTO 15
150 IF K$="N" GOTO 720
155 CLS:PRINT@40,"TO FIND THE AM
PS"
160 PRINT@101,"THE FORMULA IS I=
E/R
165 PRINT@165,"INPUT THE FOLLOWI
NG DATA"
170 PRINT
175 INPUT "VOLTS=";E
176 INPUT"OHMS= ";R
185 I=E/R
190 I=INT(I*100+.5)/100
195 PRINT@322,"THE NUMBER OF AMP
S IS";I
200 PRINT@418,"DO YOU WANT MORE
DATA(Y,N)"
205 K$=INKEY$:IF K$="" THEN 205
210 IF K$="Y" GOTO 15
215 IF K$="N" GOTO 720
220 CLS:PRINT@40,"TO FIND OHMS"
225 PRINT@101,"THE FORMULA IS R=
E/I
230 PRINT@165,"INPUT THE FOLLOWI
NG DATA"
235 PRINT:INPUT "VOLTS=";E
240 PRINT
245 INPUT "AMPS=";I
250 PRINT
255 R=E/I
260 R=INT(R*100+.5)/100
265 PRINT@322,"THE ANSWER IS"R"O
HMS
270 PRINT@418,"DO YOU WANT MORE
DATA(Y,N)
275 K$=INKEY$:IF K$="" THEN 275
280 IF K$="Y" GOTO 15
285 IF K$="N" GOTO 720
290 CLS:PRINT@38,"TO FIND POWER
IN WATTS"
295 PRINT@96,"FORMULAS ARE P=E*I
 OR P=(I*I)*R      OR P=(E*E)*R
300 PRINT@160,"INPUT THE FOLLOWI
NG DATA"
305 PRINT@224,"VOLTS &AMPS KNOWN
<5>"
310 PRINT@256,"AMPS & OHMS KNOWN
 <6>"
315 PRINT@288,"VOLTS & OHMS KNOW
N <7>"
320 PRINT:PRINT"WHICH SELECTION
DO YOU WISH?"
325 K$=INKEY$:IF K$="" THEN 325
330 IF K$="5" GOTO 345
335 IF K$="6" GOTO 450
340 IF K$="7" GOTO 510
345 CLS:PRINT@38,"FOR POWER IN W
ATTS"
350 PRINT@101,"THE FORMULA IS P=
E*I"
355 PRINT@165,"INPUT THE FOLLOWI
NG DATA"
360 PRINT:INPUT"VOLTS";E
365 INPUT"AMPS";I
370 P=E*I
375 PRINT@322,"POWER IS EQUAL TO
"P"WATTS"
380 PRINT@386, "TYPE (C) FOR HOT
 WATER COSTS"
381 PRINT@418,"TYPE (X) FOR OTHE
R COSTS"
382 PRINT@450,"TYPE (M) FOR MENU
```

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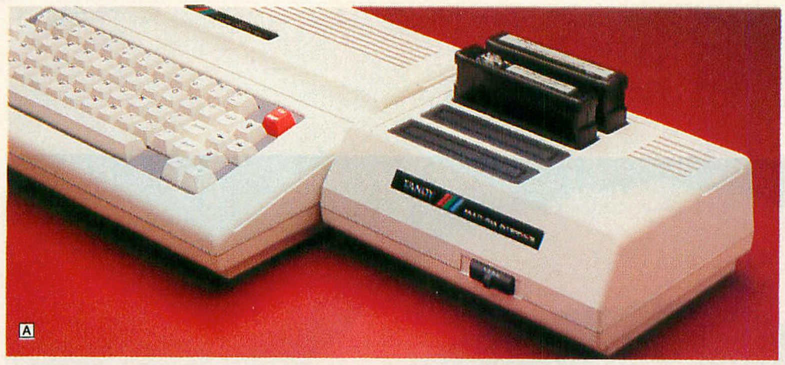
```
385 K$=INKEY$:IF K$="" THEN 385
390 IF K$="C" GOTO 640
395 IF K$="X" GOSUB 585
398 IF K$="M" GOTO 15
400 GOTO 405
405 CLS:PRINT
410 PRINT@66,"POWER CONSUMED IS"
P"WATTS"
415 PRINT@98,"RATE PER KWH IS $"
;R
420 PRINT@130,"RUN TIME IN HRS I
S";H
425 PRINT:PRINT"POWER COST IS $"
TC"IF RUN FOR "H" HOURS AT $"R"P
ER KWH"
430 GOTO 380
435 K$=INKEY$:IF K$="" THEN 435
440 IF K$="M" GOTO 15
445 IF K$="E" GOTO 720
450 CLS:PRINT@38,"FOR POWER IN W
ATTS"
455 PRINT@101,"THE FORMULA IS P=
(I*I)*R"
460 PRINT@165,"INPUT THE FOLLOWI
NG DATA"
465 PRINT:INPUT"AMPS";I
470 INPUT"OHMS";R
475 P=(I*I)*R
480 PRINT@322,"POWER IS EQUAL TO
"P"WATTS"
485 GOTO 380
490 K$=INKEY$:IF K$="" THEN 490
495 IF K$="C" GOTO 640
500 IF K$="X" GOSUB 585
505 GOTO 405
510 CLS:PRINT@38,"FOR POWER IN W
ATTS"
515 PRINT@68,"THE FORMULA IS P=(
E*E)/R
520 PRINT@100,"INPUT THE FOLLOWI
NG DATA"
525 PRINT:INPUT"VOLTS";E
530 INPUT"OHMS";R
535 P=(E*E)/R
540 P=INT(P*100+.5)/100
545 PRINT@260,"POWER IS EQUAL TO
"P"WATTS"
550 GOTO 380
555 K$=INKEY$:IF K$="" THEN 555
560 IF K$="C" GOTO 640
565 PRINT:PRINT@418,"DO YOU WANT
 MORE DATA(Y,N)
570 IF K$="X" GOSUB 585
575 GOTO 405
580 IF K$="Y" THEN 290
585 CLS:PRINT@64,"******* COST C
ALCULATIONS ******"
590 PRINT:PRINT"WATTS CONSUMED A
RE";P
595 PRINT:INPUT"RATE PER KWH ($.
000) =";R
600 INPUT"HOURS RUN";H
605 C=(P/1000)*R
610 C=INT(C*100+.5)/100
615 TC=H*C
620 RETURN
625 K$=INKEY$:IF K$="" THEN 625
630 IF K$="E" GOTO 720
635 IF K$="Y" THEN RETURN
640 CLS:PRINT@2,"FOR COST OF HOT
 WATER INPUT:"
645 PRINT:INPUT"INCOMING WATER T
EMP (F) IS ";I
650 INPUT"OUTGOING WATER TEMP IS
 (F) IS ";O
655 INPUT"   GALLONS USED ARE";G
660 INPUT"RATE/KWH ($.000) IS";R
663 REM DEGREES WATER TO BE RAIS
ED
665 D=O-I
666 REM CONVERT WATTS TO KILOWAT
TS
670 B=G*8.35*D
675 REM FORMULAE TO DETERMINE
676 PRINT@258,"BTU REQUIRED ARE
";B
677 REM FORMULAE RO DTERMINE
678 REM COST TO RAISE WATER THE
679 REM DESIRED TEMP. AT COST
680 REM PER KILOWATT HOUR
682 K=P/1000
683 KH=B/(K*56.92*60)
684 KH=INT(KH*100+.5)/100
685 C=KH*R
686 C=INT(C*100+.5)/100
690 PRINT@322,"COST TO HEAT"G"GA
LS OF WATER  BY"D"DEGREES AT $"R
"PER KWH IS $";C
695 PRINT@450," FOR MAIN MENU PR
ESS(M)"
700 PRINT@483,"IF ALL DONE PRESS
 (E)
705 K$=INKEY$:IF K$="" THEN 705
710 IF K$="M" GOTO 15
715 IF K$="E" GOTO 720
720 CLS:PRINT@230,"PROGRAM IS FI
NISHED"
725 PRINT@419,"PRESS (M) FOR MAI
N MENU"
730 K$=INKEY$:IF K$="" THEN 730
735 IF K$="M" GOTO 15
```



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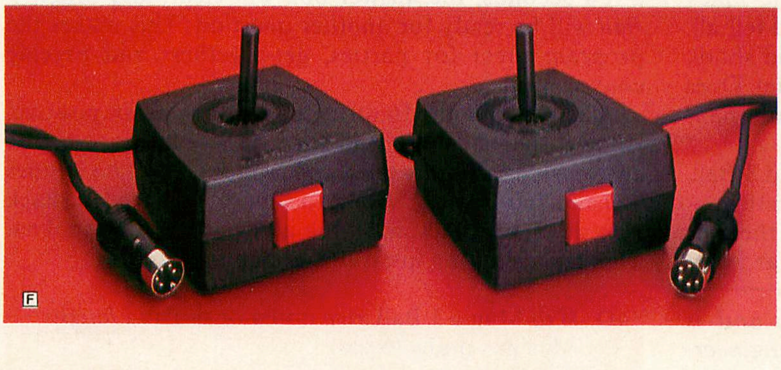

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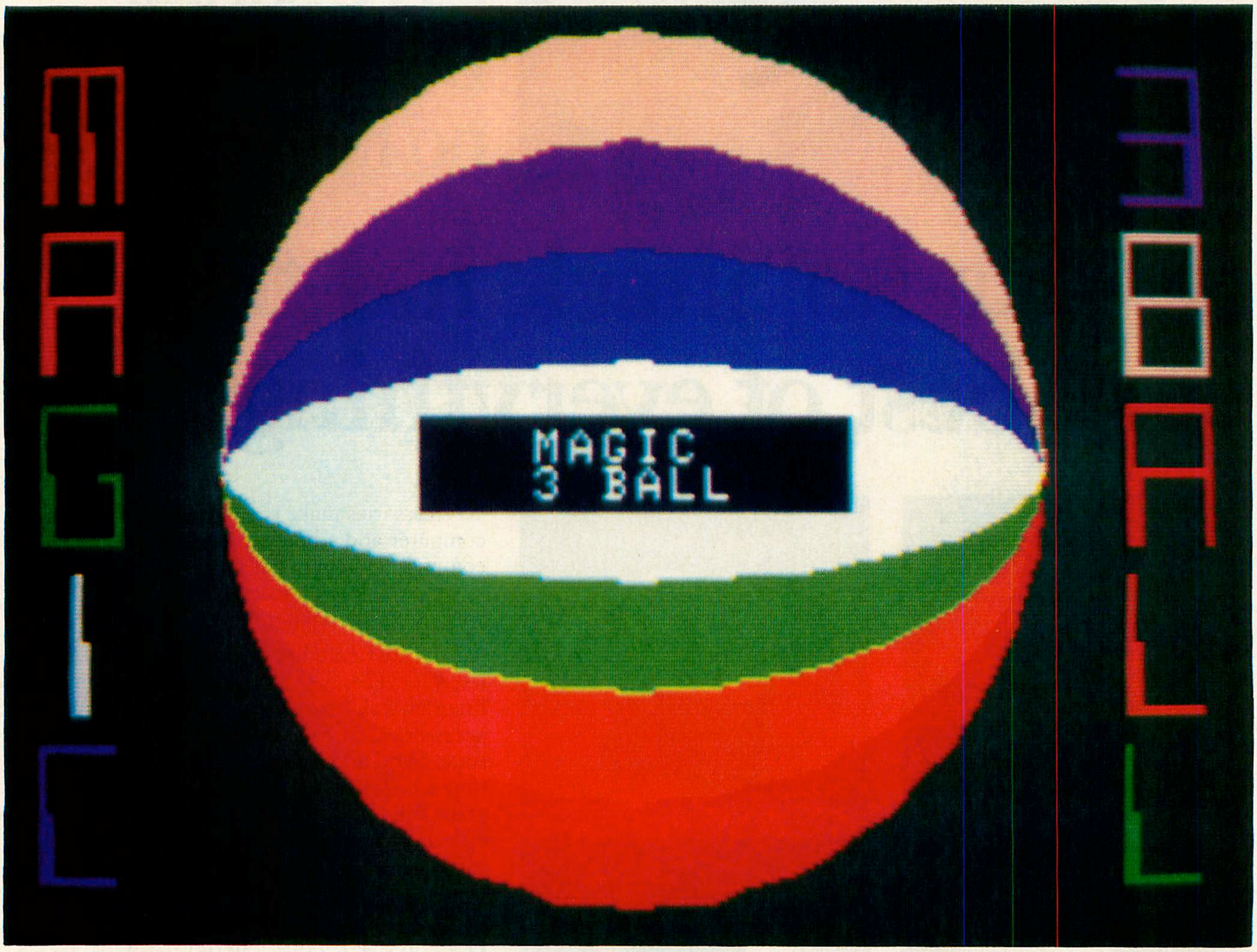

# CoCo Has All the Answers

## By Logan Ward

Remember the Magic 8 Ball? It was the black spherical object that knew all and could tell all. When you asked the ball a question and shook it, it predicted the future (or a reasonable facsimile). Does this bring back memories? Longing for that old 8 ball? Look no further. *Magic 3 Ball* is here!

*Magic 3 Ball* works exactly the same as the old 8 Ball. Once the program is loaded and run, ask a question — any question: Will I become a millionaire? Will there be a CoCo 4? Press any key and an answer will appear. After a few seconds, the answer box will clear, and *Magic 3 Ball* will be ready for another question. This makes the program great for parties, get-togethers and psychic convocations.

*Magic 3 Ball* has 16 different answers — six positive, six negative and four indifferent. These answers can be customized to fit any need and are found as data in lines 750 and 760. *Magic 3 Ball* also supports the Radio Shack Speech/Sound Pak, allowing all answers to be spoken. This makes asking questions even more exciting.

Q: *Will* Magic 3 Ball *give hours of fun and laughs?*
A: All signs point to yes.

---

*Logan Ward lives in Memphis, Tennessee, and is studying electronics technology and computer engineering at the State Technical Institute. He is head technician and service manager at The Computer Center, and his hobbies include custom programming and creating pictures with* CoCo Max.

*(Questions about this program may be addressed to the author at 2774 Lakeside Dr., Memphis, TN 38134. Please enclose an SASE for a reply.)* ☐

```
200 ......243
300 ........12
500 ......169
690 ......151
END ......44
```

**The listing:** MAGIC3

```
10 '*****************************
*
20 '         MAGIC 3 BALL
30 '    (C) 1987 LOGAN R. WARD
40 '       2774 LAKESIDE DR.
50 '       MEMPHIS,TN  38134
60 '*****************************
*
70 'THIS PROGRAM SIMULATES THE O
LD MAGIC EIGHT BALL FROM YEARS P
AST. TO GET AN ANSWER, PRESS ANY
 KEY
80 POKE65497,0:DIM P(15),Q(14),S
(14),A$(19),B$(19)
90 A=160:B=96:F=0:G=.5
100 WIDTH40:HSCREEN2
110 'READ DATA
120 FOR P=0 TO 15:READ P(P):PALE
TTE P,P(P):NEXTP
130 FOR Q=1 TO 14:READ Q(Q):READ
 S(Q):NEXTQ
140 FOR I=1 TO 7:READ R(I):NEXTI
150 FOR I=1 TO 19:READ A$(I):REA
D B$(I):NEXTI
160 CLS1:HCOLOR6,0:GOSUB470
170 'DRAW CHARACTERS
180 HDRAW"BM21,8;C4;"+A$:HDRAW"B
M21,8;"+B$:HDRAW"BM30,8;"+A$:HDR
AW"BM39,8;"+C$
190 HDRAW"BM21,45;C5;"+A$:HDRAW"
BM21,45;"+B$:HDRAW"BM39,45;"+C$:
HDRAW"BM21,59;"+B$
200 HDRAW"BM21,82;C7;"+A$:HDRAW"
BM21,82;"+B$:HDRAW"BM21,111;"+B$
:HDRAW"BM39,97;"+D$:HDRAW"BM35,9
7;"+E$
210 HDRAW"BM29,119;C11;"+A$:HDRA
W"BM21,156;C12;"+A$:HDRAW"BM21,1
56;"+B$:HDRAW"BM21,185;"+B$
220 HDRAW"BM295,8;C13;"+F$:HDRAW
"BM276,8;"+B$:HDRAW"BM276,23;"+B
$:HDRAW"BM276,37;"+B$
230 HDRAW"BM276,45;C14;"+A$:HDRA
W"BM276,45;"+B$:HDRAW"BM276,59;"
+B$:HDRAW"BM278,74;"+B$:HDRAW"BM
293,45;"+D$:HDRAW"BM295,59;"+D$
240 HDRAW"BM276,82;C4;"+A$:HDRAW
"BM276,82;"+B$:HDRAW"BM295,82;"+
C$:HDRAW"BM276,96;"+B$
250 HDRAW"BM276,119;C5;"+A$:HDRA
W"BM276,148;"+B$:HDRAW"BM276,156
```

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**The Coco Graphics Designer** allows you to mix text and pictures in all your creations. The program features picture, border, and character font editors, so that you can modify or expand the already built in libraries. Plus a special "grabber" utility is included to capture areas of high resolution screens for your picture library.

**Requirements:** a Coco or Coco II with a minimum of 32K, One Disk Drive (Disk Ext. BASIC 1.0/1.1,ADOS, or JDOS). Printers supported include: Epson RX/FX, GEMINI 10X, SG-10, NX-10, C-Itoh 8510, DMP-100/ 130/ 400/ 430, Seikosha GP-100/250, Legend 808 and Gorilla Bannana. Send a SASE for complete list of compatible printers.
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**Ordering Instructions:** All orders add $3.00 Shipping & Handling. UPS COD add $3.00. VISA/MC Accepted. NY residents add sales tax.

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| UPGRADED | Company Commander: Squad level Wargame (CC32K SG MLS) | |
| | (House to House Module included in Company Commander) | |
| | Additional Models for Company Commander 3.0 | |
| | River Crossing | $17 |
| NEW | Gemini | $17 |
| NEW | Cauldron | $17 |
| NEW | Beach Head | $17 |
| | Fire One! Submarine Simulation (CC3 D HR B) | $25 |
| | Luftflotte: Battle of Britain (CC32K SG MLS) | $25 |
| | Stalingrad: The turning point. (CC64K HR ML) | $25 |
| | Final Frontier: War in Space (CC32K D HR MLS) | $25 |
| | Fire & Steel: Waterloo Campaign (CC64K D HR MLS) | $22 |
| | Barbarossa: The War in Russia (CC64K HR ML) | $22 |
| | RedStar: Nato vs Warsaw Pact (CC32K D HR ML) | $22 |
| | DarkHorse: RedStar Sequel (CC64K D HR ML) | $22 |
| | Midway: The Turning Point in the Pacific (CC32K HR MLS) | $20 |
| | Escape From Denna: Dungeons! (CC32K SG MLS) | $15 |
| | Tunis: War in the Desert (CC32K SG B) | $15 |
| | Battle of the Bulge 1 or 2 player (CC32K SG B) | $15 |
| | Phalanx: Alexander the Great (CC32K HR ML) | $15 |
| | Rubicon II: Invasion game (CC32K SG B) | $10 |
| | Guadalcanal: America Strikes Back (CC32K SG MLS) | $10 |
| | Waterloo: Napoleon (CC32K SG MLS) | $10 |
| | Bomber Command: Strategic Bombing Mission (CC32K SG MLS) | $10 |
| | Kamikaze: Naval War in the Pacific (CC32K HR B) | $10 |
| | Starblazer: Strategy Star Trek (CC32K SG MLS) | $10 |
| | Mission Empire: Build an Empire in Space (CC32K SG B) | $10 |
| | Galactic Taipan: Economics in Space (CC32K SG B) | $10 |
| | Keyboard General: Bi-monthly newsletter yearly sub | $15 |
| | Barbarossa, Luftflotte, Battle Hymn (256K) available Tandy 1000 | |
| | **New for the Tandy 1000:** | |
| | Gray Storm Rising: War in the North Atlantic | $25 |

Codes CC — Color Computer, all versions CC3 CoCo 3 only
D — Disk only (no D means program available tape or disk)
HR — High Resolution SG — Semigraphics ML — Machine Language
MLS — Machine Language Subroutines B — Basic

***Write for free catalog!***

(Upgrades may be acquired for $5. Original tape or disk must be returned with order.)

Prices on all programs include shipping costs to USA and Canada. Others add $3.00. COD's available in USA only, add $3.50. Personal Checks accepted with no delays in USA. Others send M.O. or Bank Draft in US funds. Programs shipped within 24 hours except on weekends. Color Computer and Tandy 1000, TM Tandy Corp. Florida residents add 5% sales tax.

Canadians may order direct from: **M & M Software,** #203 818 Watson Cres., Dawson Creek, B.C. VIG 1N8. Write M & M Software for information.

***ARK ROYAL GAMES***
P.O. Box 14806
Jacksonville, FL 32238
(904) 786-8603

ARK
ROYAL
GAMES

```
;C7;"+A$:HDRAW"BM276,185;"+B$
260 'DRAW BALL
270 FOR I=1 TO 14STEP2:HCIRCLE(A
,B),B,Q(I),S(I),F,G
280 IF I+1>7 THEN F=.5:G=1
290 HCIRCLE(A,B),B,Q(I+1),S(I+1)
,F,G
300 HPAINT(A,R((I+1)/2)),Q(I),Q(
I)
310 NEXT I
320 FOR W=17 TO 19:GOSUB400:NEXT
W
330 I$=INKEY$:IF I$<>"" THEN GOS
UB390
340 FOR I=13 TO 1 STEP-1:X=RND(6
3):PALETTEQ(I),X:NEXTI
350 ON BRK GOTO700
360 IF SS=1 THEN S=RND(200):SOUN
DS,1
370 GOTO330
380 'PRINT ANSWER
390 W=RND(16)
400 HCOLOR9,0:HLINE(110,85)-(210
,105),PSET,BF
410 A2=LEN(A$(W)):B2=LEN(B$(W)):
A1=(40-A2)/2:B1=(40-B2)/2
420 HCOLOR15,0:HPRINT(A1,11),A$(
W):HPRINT(B1,12),B$(W)
430 IF W<18 THEN GOSUB550 ELSE F
OR N=1 TO 3000:NEXTN
440 IF W=19 THEN GOSUB670
450 HCOLOR11,0:HLINE(110,85)-(21
0,105),PSET,BF
460 RETURN
470 A$="D30;R3;U15;L1;D14;L1;U29
"
480 B$="R18;D1;L18"
490 C$="D30;R1;U30"
500 D$="D15;R1;U15"
510 E$="R4;D1;L4
520 F$="D30;L3;U15;R1;D14;R1;U29
"
530 RETURN
540 'SPEECH ROUTINE
550 POKE65496,0:S$=A$(W)+CHR$(32
)+CHR$(32)+B$(W):K=&HFF00:L=&HFF
7E
560 POKEK+1,52:POKEK+3,63:POKEK+
35,60
570 GOSUB590
580 RETURN
590 FOR I=1 TO LEN(S$)
600 IF PEEK(L) AND 128=0 THEN 60
0
610 POKEL,ASC(MID$(S$,I,1))
620 NEXT I
630 IF PEEK(L) AND 128=0 THEN 63
0
640 POKEL,13
650 FOR SD=1 TO 1300:NEXTSD
660 POKE65497,0:RETURN
670 Z$=INKEY$
680 IF Z$="Y" THEN SS=1:RETURN
690 IF Z$="N" THEN SS=0:RETURN E
LSE GOTO670
700 POKE65496,0:END
710 DATA 3,25,0,34,36,38,56,20,8
,1,20,63,8,40,60,63
720 'DATA 4,20,5,30,7,60,11,96,1
2,132,13,152,14,172
730 DATA 4,1,4,.75,5,.75,5,.5,7,
.5,7,.25,11,.25,11,.25,12,.25,12
,.5,13,.5,13,.75,14,.75,14,1
740 DATA 172,152,132,96,60,30,20
750 DATA THINK HARDER,TRY AGAIN,
SEEK  ANSWER,LATER,DO NOT BET,ON
  IT,OUTLOOK,GREAT,MORE  THAN,LI
KELY,YOU  CAN,COUNT  ON IT,OUTLO
OK  NOT,VERY  GOOD,SOURCES,SAY N
O,ALL  SIGNS,POINT TO YES,FORECA
ST,AWFUL,LOOKS LIKE,THUMBS DOWN,
BETTER NOT,SAY  NOW
760 DATA REPLY CLOUDY,TRY  AGAIN
,VERY,UNCERTAIN,WITHOUT,QUESTION
,LOOKS LIKE,A  YES,MAGIC,3 BALL,
(C) 1987,LOGAN WARD,SOUND,<Y> OR
 <N>
```

*If you're still plugging printed circuit cards into your*

CoCo 1
CoCo 2
CoCo 3

*without a card guide . . .*

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- Execute OS-9 commands from within XTERM
- Definable macro keys
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- Works with standard screen. XSCREEN, WORDPAK or DISTO 80 column board.

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- Full sorting
- Complete pattern matching

OS-9 calculator
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- +, -, *, /, AND,OR, XOR, NOT

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## XDIS

OS-9 disassembler

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| | |
|---|---|
| 512k memory upgrade | $80.00 |
| Printers | |
| Citizen 120D | CALL |
| Star NP10 | CALL |

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- Works with standard text screen, XSCREEN, WORDPAK, or DISTO
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- Full block commands
- Find and Replace commands
- Execute OS-9 commands from within
- Proportional spacing supported
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- Page numbering in decimal or Roman numerals
- Margins and headers can be set different for even and odd pages

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## XMERGE

Mail merge capabilities for XWORD

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## XSPELL

OS-9 spelling checker, with 20000 and 40000 word dictionaries

**$39.95**

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OS-9 full screen editor

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# AND FOR RS DOS ...

## SMALL BUSINESS ACCOUNTING

This sales-based accounting package is designed for the non-accounting oriented businessman. It also contains the flexibility for the accounting oriented user to set up a double entry journal with an almost unlimited chart of accounts. Includes Sales Entry, transaction driven Accounts Receivable and Accounts Payable, Journal Entry, Payroll Disbursement, and Record Maintenance programs. System outputs include Balance Sheet, Income Statement, Customer and Vendor status Reports, Accounts Receivable and Payable Aging Reports, Check Register, Sales Reports, Account Status Lists, and a Journal Posting List. **$79.95**

## INVENTORY CONTROL/SALES ANALYSIS

This module is designed to handle inventory control, with user defined product codes, and produce a detailed analysis of the business' sales and the sales force. One may enter/update inventory data, enter sales, run five sales analysis reports, run five inventory reports, set up product codes, enter / update salesman records, and update the SBAP inventory. **$59.95**

## PAYROLL

Designed for maintaining personnel and payroll data for up to 200 hourly and salaried employees with 8 deductions each. Calculates payroll and tax amounts, prints checks and maintains year-to-date totals which can be automatically transferred to the SBA package. Computes each pay period's totals for straight time, overtime and bonus pay and determines taxes to be withheld. Additional outputs include mailing list, listing of employees, year-to-date federal and/or state tax listing, and a listing of current misc. deductions. Suited for use in all states except Oklahoma and Delaware. **$59.95**

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Handles 45 accounts. Enters cash expenses as easily as checks. Handles 26 expense categories. Menu driven and user friendly. **$39.95**

## ACCOUNTS RECEIVABLE

Includes detailed audit trails and history reports for each customer, prepares invoices and monthly statements, mailing labels, aging lists, and an alphabetized customer listing. The user can define net terms for commercial accounts or finance charges for revolving accounts. This package functions as a standalone A/R system or integrates with the Small Business Accounting package. **$59.95**

## ACCOUNTS PAYABLE

Designed for the maintenance of vendor and A/P invoice files. The system prints checks, voids checks, cancels checks, deletes cancelled checks, and deletes paid A/P invoices. The user can run a Vendor List, Vendor Status report, Vendor Aged report, and an A/P Check Register. This package can be used either as a standalone A/P system or can be integrated with the Small Business Accounting Package. **$59.95**

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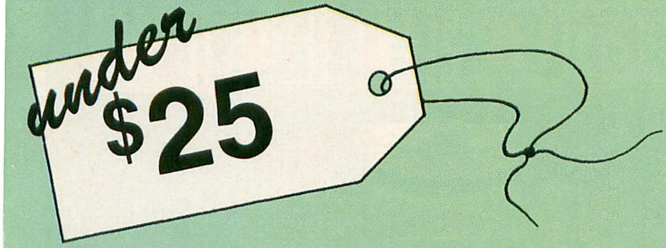
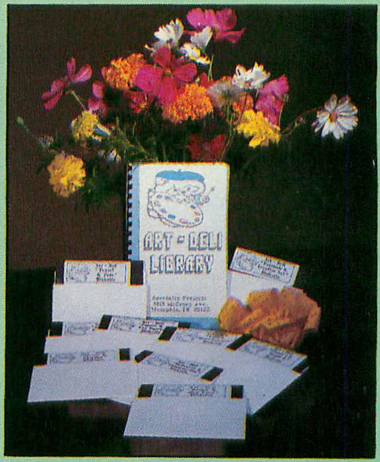


# Gift Buyer's Guide

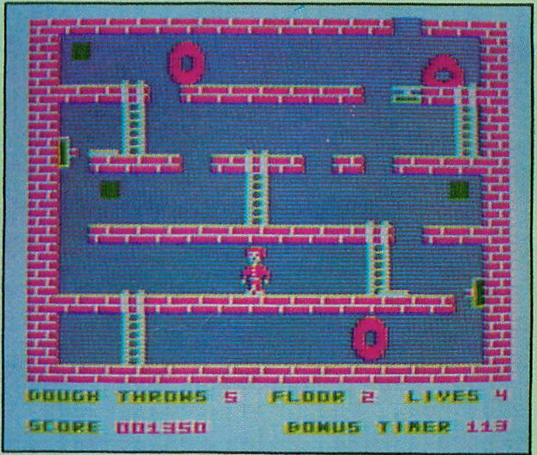
*Looking for just the right gift for that special CoCo someone? Look no further — our Gift Buyer's Guide has a full selection of prized delights in price categories sure to please even old Scrooge!*

*(For ordering information on these gift buyer's selections, see Page 61.)*

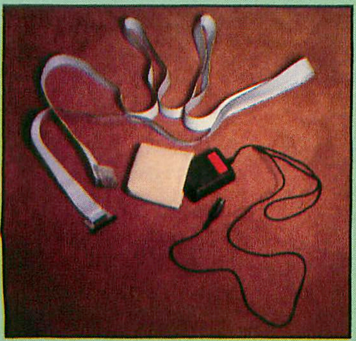
Add a personal touch to seasonal letters and announcements with decorative printer paper. From Computer Creations, $10 per package of 100 sheets.



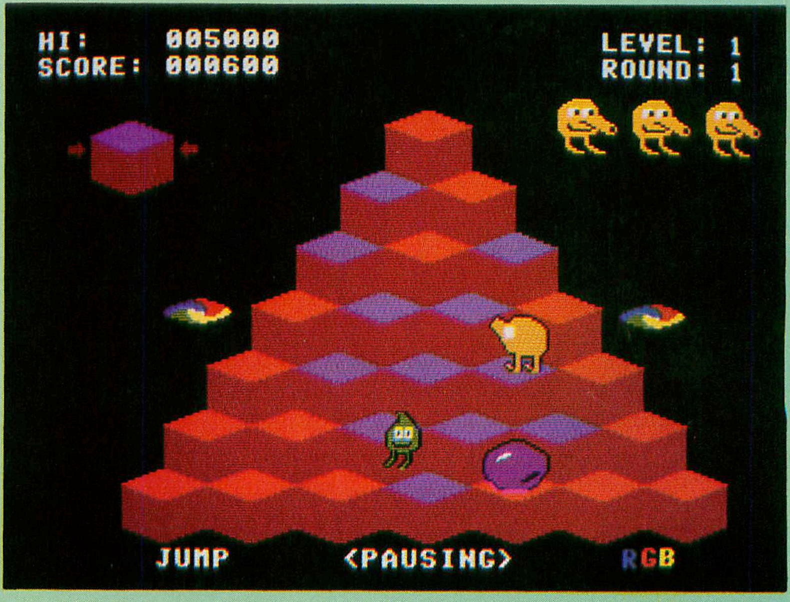
*Art Deli* is a smorgasbord of graphic treats for all occasions. From Specialty Projects, $12.95; set of 10 disks, $99.95.


DOUGH THROWS 5 FLOOR 2 LIVES 4
SCORE 001350 BONUS TIMER 113

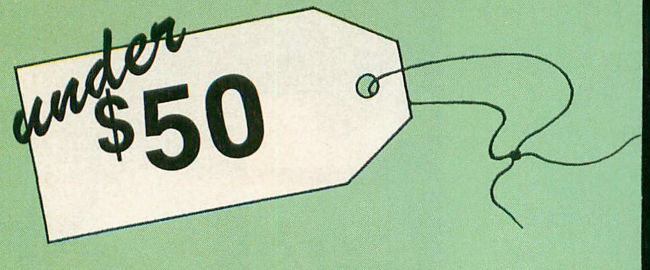
Don your baker's hat for a fun-filled time with *Donut Dilemma*. From Tom Mix Software, $24.95.

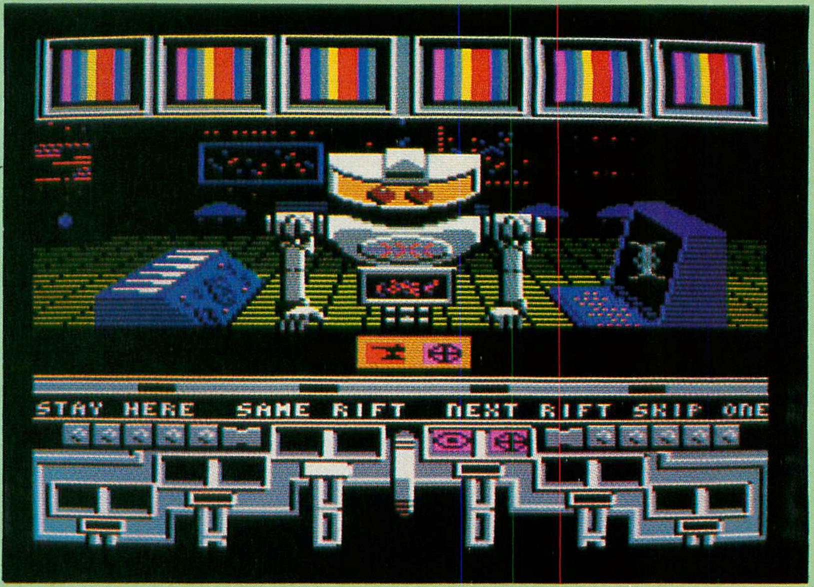


A little CoCo mouse can sleep tight in this handy MousePouch. From H&H Enterprises, $5.95. Put a CoCo 2 or 3 keyboard at your finger tips with the CoCo keyboard Extender Cable. From Spectrum Projects Inc., $19.95.

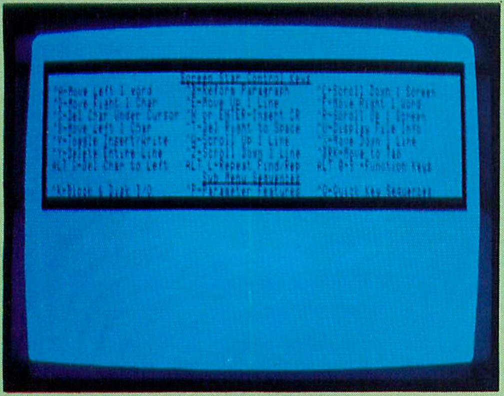

HI: 005000
SCORE: 000600
LEVEL: 1
ROUND: 1
JUMP
<PAUSING>
RGB

*Pyramix* offers animation, graphics and sound in a challenging game of arcade fun. From Dr. Preble's Programs for the CoCo 3, $24.95.



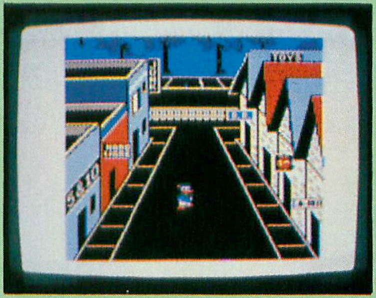

STAY HERE
SAME RIFT
NEXT RIFT
SKIP ONE

*Koronis Rift*, a shoot-'em-up space Adventure, takes full advantage of the CoCo 3 and OS-9 Level II. From Epyx, $29.95. Available in Radio Shack stores nationwide.

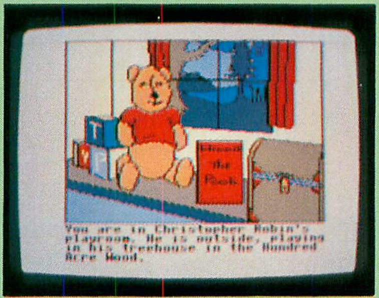


```
                 Screen Star Control Keys
^A=Move Left 1 Word      ^B=Reform Paragraph      ^C=Scroll Down 1 Screen
^D=Move Right 1 Char     ^E=Move Up 1 Line        ^F=Move Right 1 Word
^G=Del Char Under Cursor ^N or ENTER=Insert CR    ^R=Scroll Up 1 Screen
^S=Move Left 1 Char      ^T=Del Right to Space    ^U=Display File Info
^V=Toggle Insert/Write   ^W=Scroll Up 1 Line      ^X=Move Down 1 Line
^Y=Delete Entire Line    ^Z=Scroll Down 1 Line    ^I=Move to Tab
ALT D=Del Char to Left   ALT L=Repeat Find/Rep    ALT 0-9 =Function Keys
                      Sub Menu Sequences
^K=Block & Disk I/O      ^P=Parameter Features    ^Q=Quick Key Sequences
```

*Screen Star* and *OS-9 Text Formatter* provide all the capabilities of word processing for the CoCo 1, 2 and 3. From Computerware, *Screen Star*, $49.95; *OS-9 Text Formatter*, $34.95; both for $74.95.



*Donald Duck's Playground* turns learning into child's play on the CoCo 1, 2 and 3. From Sierra On-Line, $34.95. Available in Radio Shack stores nationwide.

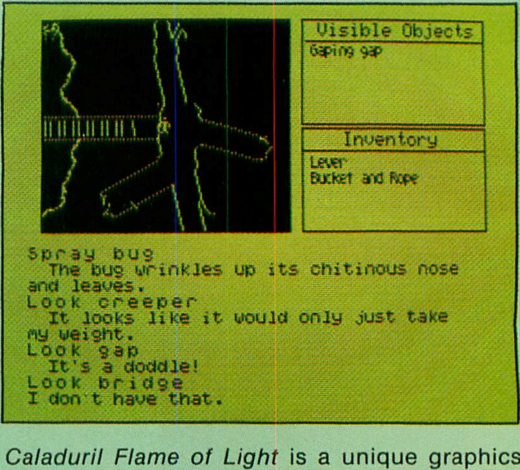

Winnie the Pooh

```
You are in Christopher Robin's
playroom. He is outside, playing
in his treehouse in the Hundred
Acre Wood.
```

The adventures of *Winnie the Pooh in the Hundred Acres Wood* will delight your favorite youngster. From Sierra On-Line, $34.95. Available in Radio Shack stores nationwide for the CoCo 1, 2 and 3.

RAINBOW
THE COMPLETE RAINBOW GUIDE TO OS-9
ADVENTURES
THE SECOND RAINBOW BOOK OF SIMULATIONS
THE COMPLETE RAINBOW GUIDE TO OS-9 LEVEL II
By Dale L. Puckett and Peter Dibble

A gift subscription to THE RAINBOW, complete with magazine binders, will be remembered long after the holiday season ends. Or take advantage of the Rainbow Bookshelf specials for that "something extra."


Visible Objects
Inventory

```
Gaping gap
Lever
Bucket and Rope
Spray bug
  The bug wrinkles up its chitinous nose
and leaves.
Look creeper
  It looks like it would only just take
my weight.
Look gap
  It's a doddle!
Look bridge
I don't have that.
```

*Caladuril Flame of Light* is a unique graphics Adventure game sure to please any CoCoist. From Diecom Products, Inc., $28.95 U.S.; $38.95 CND.

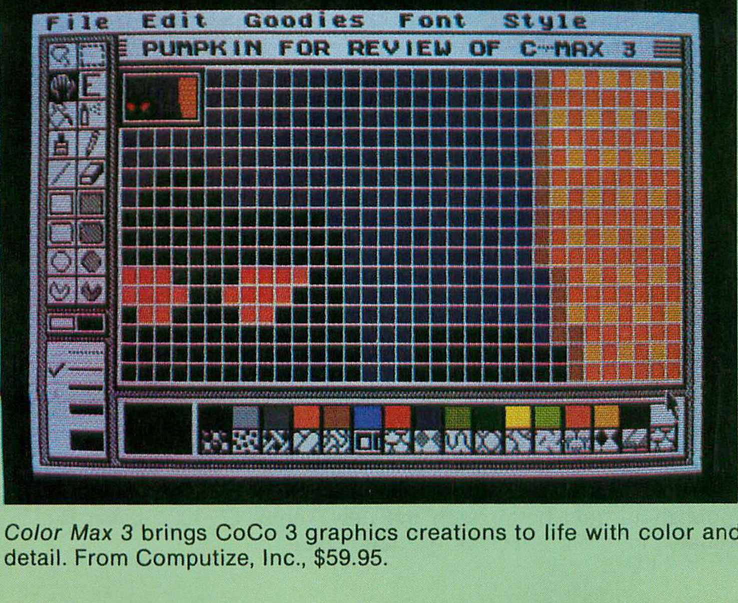
## under $100

Operating System
Development System
DeskMate 3
OS-9

Explore the full potential of the Color Computer with Tandy's *OS-9 Level Two Development System* ($99.95), *OS-9 Level Two* ($79.95), and *Deskmate 3* ($99.95). Available in Radio Shack stores nationwide.

Enjoy the sounds of silence with the Printer Muffler 80 from Kensington Microware Ltd., $59.95.

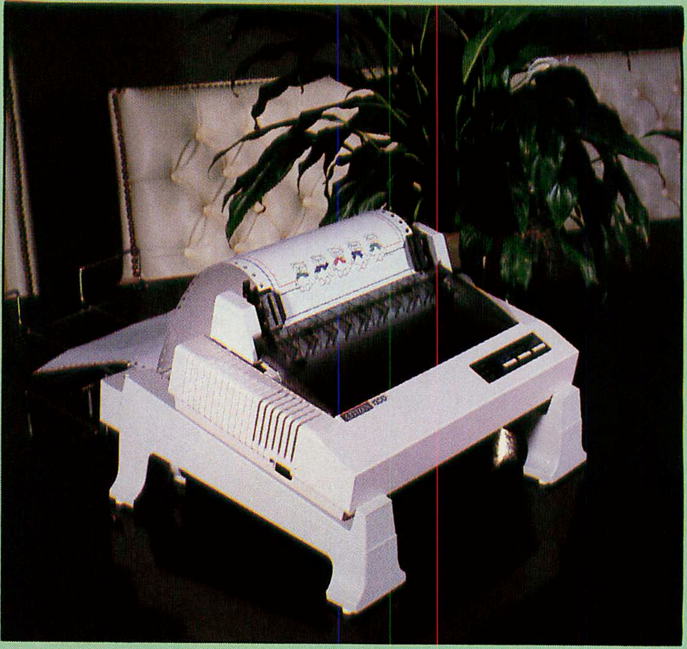
## over $100


File Edit Goodies Font Style
PUMPKIN FOR REVIEW OF C-MAX 3

*Color Max 3* brings CoCo 3 graphics creations to life with color and detail. From Computize, Inc., $59.95.

The Color Computer 3 unveils the mystery of graphics and animation, spreadsheets and databases, education and Adventure. A great gift for any age. From Tandy Corporation, $199.95; CM-8 monitor, $299.95. Available in Radio Shack stores nationwide.

# over $100



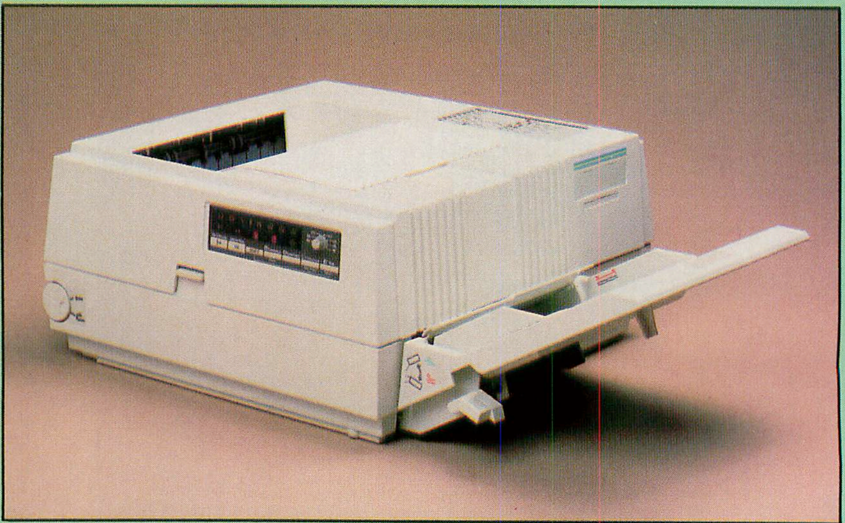
The Citizen 120D Printer Package is the perfect complement to any CoCo system. From Dayton Associates of W.R. Hall, Inc., $229.95. This versatile Unistand dresses up any printer. From MicroComputer Accessories, Inc., $19.95.

Avatex 2400

The Avatex 2400 Modem opens the door to communications. From Cinsoft, $229; with RS-232 cable and *Autoterm 6.0*, $269.

*CoCo Midi 2* and the Color Computer add music to all the holiday festivities. From Speech Systems, $149.95.

This Magnavox RGB Monitor 80 (Model 8CM515) from Howard Medical Computers provides plenty of resolution and an excellent display, $298; CoCo 3 cable, $19.95 with monitor purchase.



Desktop publishing gets better with the new Tandy LP-1000 Laser Printer, $2,199. Available in Radio Shack stores nationwide.

## Products listed in the Gift Buyer's Guide are available from the following companies:

Cinsoft
2335 Losantiville
Cincinnati, OH 45237
(513) 396-SOFT

Computer Creations
P.O. Box 3744
Long Beach, CA 90803
(213) 434-2655

Computerware
4403 Manchester Avenue
Encinitas, CA 92024
(619) 436-3512

Computize, Inc.
P.O. Box 207
Langhorne, PA 19047
(215) 946-7260

Dayton Associates of
W.R. Hall, Inc.
7201 Claircrest Bldg. C
Dayton, OH 45424
(513) 236-1454

Diecom Products, Inc.
6715 Fifth Line
Milton, Ontario
Canada L9T 2X8
(416) 878-8358

Dr. Preble's Programs
6540 Outer Loop
Louisville, KY 40228
(502) 241-6474

H&H Enterprises
Box 2672
Corona, PA 91718
(714) 737-1375

Howard Medical Computers
1690 North Elston
Chicago, IL 60622
(800) 443-1444

Kensington Microware Ltd.
251 Park Avenue S
New York, NY 10010
(212) 475-5200

MicroComputer Accessories, Inc.
5405 Jandy Place
P.O. Box 66911
Los Angeles, CA 90066
(213) 301-9400

Tom Mix Software
4285 Bradford NE
Grand Rapids, MI 49506
(616) 957-0444

Specialty Projects
4810 McCrory
Memphis, TN 38122
(901) 682-8737

Spectrum Projects, Inc.
P.O. Box 264
Howard Beach, NY 11414
(718) 835-1344

Speech Systems
38 W. 255 Deerpath Road
Batavia, IL 60510
(312) 879-6880

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300/1200 baud Fully Hayes compatible Modem - 2 Year Warranty
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300/1200/2400 baud Fully Hayes Compatible Modem - CCITT 2 Year Warranty
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[Modem & Cable]

**Software**

**'KEEP-TRAK' General Ledger Reg. $69.95—Only $39.95**
**"Double-Entry" General Ledger Accounting System** for home or business: 16k, 32k, 64k. User-friendly, menu-driven. Program features: balance sheet, income & expense statement [current & 'YTD'], journal, ledger, 899 accounts [ 2350 entries on 32k & 64k [710 accounts & entries on 16k] [disk only]. Version 1.2 has screen printouts.
Rainbow Review 1.1 - 9/84 : 1.2-4/85

**"OMEGA FILE" Reg. $69.95—ONLY $24.95**
Filing data base. File any information with Omega File. Records can have up to 16 fields with 255 characters per field [4080 characters/record]. Sort, match & print any field. User friendly menu driven. Manual included [32k/64k disk only].
Rainbow Review 3/85. Hot CoCo 10/85

**BOB'S MAGIC GRAPHIC MACHINE**
Can generate BASIC code to use in your programs. Easy drawing and manipulation of circles, elipses, boxes, lines and ARCS. Single joystick operation with on line HELPS at all times. Allows text on the graphics screen & movement of objects on the screen. Can be used as a stand-alone graphics editor. Instruction Manual. **GRAPHICS EDITOR. REG. $39.95—ONLY $24.95** for disk or tape. 64k ECB.
Rainbow Review 7/85, Hot CoCo 9/85 **"The graphics bargain of the year"**

**'KEEP-TRAK' Accounts Receivable.**
Features: auto interest calculation, auto ageing of accounts, installment sales, total due sales, explanation space as long as you need, detailed statements, 'KEEP-TRAK' General Ledger tie in, account number checking, credit limit checking & more. User friendly/menu driven. Includes manual. **$39.95** or **$49.95** General Ledger & Accounts Receivables. [Disk Only].

**'COCO WINDOWS'**
With hi-res character display and window generator. Features an enhanced key board [klicks] and 10 programmable function keys. Allows the user to create multiple windows from basic. Includes menu driven printer setup and auto line numbering. Four function calculator, with memory. The above options can be called anytime while running or writing in BASIC. APPLE PULL YOUR DRAPES. YOU DON'T WANT TO SEE THIS. **$24.95** [disk or tape] includes manual.

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**(800) 942-9402**
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# Some Helpful Improvements

## By Cray Augsburg
## Rainbow Technical Editor

**Marc Genois** (MARCGENOIS) of Beauport, Quebec, has found that *Greg-E-Term* works quite well through the CoCo 3's rear serial port at 2400 baud. For those who want to go this route, Marc suggests the following steps:

1) Type `LOADM"GTERM"` and press ENTER.
2) Type `POKE&H15AF,1:POKE&H15B0,&H74:POKE&H15B7,&H1A` and press ENTER.
3) Enter `SAVEM"GTERM",&HE00,&H652C,&HE00`

After these changes, the 110 baud option of *Greg-E-Term* will cause the program to run at 2400 baud through the serial port. Marc reports that he has no problem with lost characters or garbage when using *Greg-E-Term* in this manner.

**A New Report Form**

For the convenience of CoCo SIG users, **Jim Reed** (JIMREED), manager of the CoCo SIG, has created a new online form. This new form is designed to allow users to report problems with their RAINBOW magazine subscriptions. This form will also allow Falsoft personnel to more efficiently handle your problem, thereby reducing the time required to achieve a proper solution.

To get to the form, you must first enter the Rainbow Magazine Services section of the SIG. This is accomplished by entering `RAIN` at the main CoCo SIG prompt. Once there, simply enter `REPORT` (for Report Subscription Problem) and you will be taken into the proper form. Once you have selected this form, you only need to answer a few simple questions.

You will first be asked to confirm that you are reporting a problem or making

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*Cray Augsburg is RAINBOW's technical editor and has an associate's degree in electrical engineering. He and his wife, Ruth Ann, have two children and live in Louisville, Kentucky. His username on Delphi is CRAY.*

# Database Report

SIGop **Greg Law** (GREGL) has set aside two new topics in his database: the Programmers Den topic and a Tutorials and Education topic. Greg hopes to have development programs placed in the Programmers Den area where programmers can help each other debug and beta test them. The Tutorials and Education topic is for the wealth of tutorials that are being written by avid OS-9 users to help each other.

In the Users Group topic area, Greg Law posted *DISASM*, an OS-9 disassembler, with documentation and source code; several CoCo configuration modules for *Dynacalc*, *DynaStar* and *RMS*; a smart terminal program called *COMM*, written in BASIC09; a clock driver for the Computerware 6800 CL4 CalClock/Timer board, including source code; *CHVOLNAM*, a BASIC09 program that changes the name of a volume; a file check utility that determines file status of the specified input file; *CAL*, a simple little program that demonstrates two useful properties of Julian dates; *GOTOXY* modules for Level II standard *DynaStar*; a utility to allow a user to change his or her password, and a BASIC09 utility to interactively change the terminal configuration.

In the Utilities topic area, **Peter Durham** (PEDXING) posted *SORTDIR.AR*, a C program to sort directories. Complete C source is included. Peter also uploaded *OS9P3*, a kernel extension module for Level II CoCo OS-9 that adds full-text "printer" style error messages. Source code is also included. **George Janssen** (GBJANSSEN) sent an updated version of his fine `PAK`, `FILEX.PAK` and `FILES.PAK` utilities. Greg Law posted *RS—COPY*, which allows *TRSCOPY* to work correctly under Level II. **Michael Washburn** (COMPZAP) sent us `PAUSE.B09` — a BASIC09 source file to set pause for the current window, and `PRINT.B09`, a window print command for Gemini and Star printers.

In the Tutorials and Education topic area, **Brian Wright** (POLTERGEIST) uploaded an article that explains some of the basic OS-9 concepts. **Andrew Ellinor** (CROPPER) sent us an article he wrote explaining the concepts of operating systems. It also explains many of the great features of Level II to CoCo 3 owners who have not yet purchased it.

In the Patches topic area, Greg Law provided `PASCAL.FIX`, a modpatch script file for patching `PASCAL` to work properly under Level II, and `LOGIN.FIX`, a modpatch script file for patching the Level I Login command to work with Level II.

In the Graphics topic area, **Dale Puckett** (DALEP) uploaded the *KISSDraw* program from his column in RAINBOW. Dale hopes to see the continuing evolution of *KISSDraw* become a CoCo community project. **Dave Archer** (DAVEARCHER) sent us his *FONTED* program, which is a simple font editor for an inquiry about your subscription. Simply press Y for yes or N for no and then press ENTER. After this, you will be asked for your subscription number and expiration date. This information can be found on the label of your copy of the RAINBOW.

Next, you will need to enter your full name and address. Most importantly, we must have your full name and address to properly handle a situation. All too often we receive messages from such users as IXZ1966 saying, "My subscription just ran out . . . please extend it." The user has included neither his real name nor his address. There is very little we can do with such a request. Even if IXZ1966 has filled out a user profile in the Member Directory section of the SIG (something all users should do), we still don't have any idea what his subscription number and expiration date are. Indeed, since we publish several magazines, we don't even know to which magazine IXZ1966 is referring. And his complete address may not be given in his user profile.

Finally, you will be given plenty of space to leave your report/inquiry. Just enter up to 20 lines of text and press CONTROL-Z when you are done. You will then be allowed to make suggestions to the RAINBOW staff.

It really is a simple matter to use this form. We do encourage its use as well as use of the many other forms in the Rainbow Magazine Services section of the SIG. From here you can order RAINBOWfest tickets as well as subscriptions to RAINBOW. You can also report address changes and even ask questions of our technical experts. The main thing is to explore the CoCo SIG and learn to use it to its fullest.

### Where It's @

Some of you might have noticed a peculiar thing while accessing Delphi through Telenet. If you should happen to press the '@' key as the first character on a line and then immediately follow it with a carriage return (ENTER), you will quickly find yourself at the Telenet prompt. However, short of typing CONT or HANG and pressing ENTER, there is nothing you can do. CONT will return you to where you were on Delphi and HANG will disconnect Telenet. Typing HELP, INFO, C DELPHI or any other text besides CONT will result in Telenet echoing a question mark to your screen.

Now, on most computers, this really isn't that big a deal. On the CoCo, however, the '@' key is located just above the ENTER key. I don't know about you, but at least once during any given computing session I will go for the ENTER and accidentally press the '@' key, my finger sliding off that one right into the ENTER key. Needless to say, if I am on Delphi, I find myself in a funny predicament. So, be forewarned! It can happen to the best of us. Just remember that a simple CONT followed by an ENTER will take you right back where you left off. Just press ENTER once more and the current Delphi prompt will be redisplayed. ☐

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Level II written in BASIC09. **Steve Clark** (STEVECLARK) uploaded a utility to display PMODE 4 graphics under OS-9 Level II windows.

**CoCo SIG**

In the General topic area, **Kevin Nickols** (NICKOLS) presented us with the August issue of the *Tandy Newsletter.* **Jim Reed** (JIMREED) provided more information on the pending FCC rate hike action, while Brian Wright sent us another outline of the FCC proposal.

In the Source Code topic area, **Doug Masten** (DMASTEN) provided us with a fast disk duplicating utility for 512K CoCo 3s.

In the Utilities topic area, **Roger Krupski** (HARDWAREHACK) sent us his patches for Disk *EDTASM* to allow it to run correctly on the CoCo 3. **Brandon Knight** (KNIGHT1) sent us two BASIC programs, one to disable a disk controller under software control, and a second program that "locks out" unused granules, making a disk appear full. **Gerry Thomas** (INET191) sent us a useful editing utility for removing linefeed and nulls from downloaded text files. The program makes use of the special graphics available on the CoCo 3. **Ira Goldwyn** (IRAG) sent us *TC12*, the latest version of an archiving and de-archiving utility. The original BASIC program was written by John Lauro, and he has completely redone this version in fast machine language. **Marc Genois** (MARCGENOIS) uploaded his version of a similar program, called *Archives*, for Disk BASIC Version 1.1 only. Marc's version is also written in efficient machine language. **Marlin Simmons** (LINLEE) posted a set of patches called ARCMOD to the BASIC version of *ARC* to make it usable with Disk BASIC 1.0 systems. **Eric Robichaud** (EGROBICHAUD) sent us his short but useful matrix manipulation programs. **Jim Sparks** (ESCOMAN) sent us his program *MAKEBAS* that will read an ASCII data file from disk and make a BASIC program from that data. It's great for those who don't have a SCAN command. **Dave Ferreira** (SKEEVE) uploaded his very latest version of the popular Omega file utilities. **Glen Hathaway** (HATHAWAY) also favored us with a revised edition of his popular *Snap* disk editor.

In the Hardware Hacking topic area, **Marty Goodman** (MARTYGOODMAN) provided another informative hardware article, this one detailing the problems faced by owners of the Radio Shack Direct Connect Modem Pack. It suggests various sorts of fixes for these problems, and includes a description of how to modify the pack so that it occupies the same addresses as those used by the RS-232 pack, allowing it to work with software that formerly would support only the RS-232 pack.

In the Games topic area, **John Brennan** (FIREFLY) sent us the great *Battle at Vulcan* game, and **Michael Schneider** (MSCHNEIDER) provided a set of patches to selected games to allow the use of an RGB monitor with them.

In the Graphics topic area, **Jason Forbes** (COCO3KID) sent us some of his favorite digitized pictures, including a picture of "Ron Headroom." Michael Schneider sent us MGE pictures of two lovely female faces and one of the cartoon character Spiderman. **Richard Trasborg** (TRAS) sent us a picture of Erik Gavriluk and Greg Miller that was digitized from the pages of RAINBOW. **James Farmer** (MODEMMASTER) uploaded an original drawing that he called "Spacewar." **Craig Luecke** (LUECKE) sent us an MGE picture promoting RAINBOW magazine. Ira Goldwyn uploaded three ARCed files that contained a total of 17 digitized photos. **Erik Gavriluk** (ERIKGAV) uploaded an outstanding pair of machine language utilities to allow CoCo 3 owners to view DS-69B digitized pictures. Eric Robichaud sent us three outstanding Macintosh pictures that can be viewed by Erik Gavriluk's utilities. He also sent us three more MGE pictures, including an interesting picture of Alfred E. Neuman. I uploaded some MGE scenes from across the U.S. — a picture of a youth skateboarding in space, and another colorful picture of Donald Duck.

In the Music topic area, John Brennan uploaded his "Tuner Helper" for guitars. (Honest, that's what he called it!) **Pete Ellison** (UCFER) sent us 10 of his great musical favorites, including the Toyota theme song and music from the Burger King and McDonald's commercials. All *MUSICA* users will want these. **Randy Cassel** (BBTROLL) sent us his rendition of "Music Box Dancer," and some more four-part harmony.

In the Data Communications topic area, **Mike Ward** (MIKEWARD) provided *RLETERM*, an interesting graphics terminal program. *RLETERM* is a "no frills" terminal program that will convert an RLE picture into a screen image as it's being sent to your computer. You may see the picture being built while you're online. (This grouping also included three RLE pictures drawn by Ana Landa for your use in demonstrating *RLETERM*.)

**— Don Hutchison**
**Database Manager**
**Rainbow CoCo SIG**

# Getting Started with Delphi

## By Don Hutchison

**Rainbow's Delphi Database Manager**

Many new CoCo users have heard about Delphi and also about RAINBOW's efforts to bring the CoCo community together online. The concept of a nationwide network and a national information service is quite new and intriguing to most, but a little mystifying to new users. What I'd like to do here is answer some of the questions that potential Delphi users may have.

### What is Delphi?

It's an information service. It operates on large computers that are located near Boston, Mass. Computer hobbyists can hook up to these computers via phone lines from almost anywhere in the world. Once connected to Delphi, you have instant access to a vast amount of information and services, such as airline schedules, financial news, electronic mail, magazines, books, shopping services, news, weather, sports and groups dedicated to CoCo users.

### What does RAINBOW have to do with Delphi?

THE RAINBOW operates "The CoCo SIG" and "OS-9 Online," two of the Special Interest Groups (SIGs) on Delphi. THE RAINBOW doesn't own Delphi, nor does Delphi own THE RAINBOW. THE RAINBOW simply uses the equipment and services that Delphi furnishes in order to provide a place for CoCo enthusiasts to meet and share ideas. Your connect charges pay for your access to this service.

### Do I need anything special to use Delphi?

You can access Delphi using your CoCo, a telephone, a special device called a modem, and a suitable terminal program. This will make it possible for you to use your CoCo to access all of the services available on Delphi.

### What on earth is a modem?

A modem is simply a small box that sits on your desk and furnishes the important connection between your CoCo's serial port and the phone lines. A modem is needed on each end of the phone line, and Delphi provides a modem at their end.

A modem (an abbreviation for *modulator-demodulator*) simply converts the ones and zeroes that your CoCo supplies to it into different tones. These tones can be sent over ordinary phone lines to a remote modem such as the ones Delphi uses. The remote modem converts the tones back into ones and zeroes and supplies them to Delphi's computers. It's really just an efficient way to connect two widely separated computers with a minimum of hardware.

Modems for computer hobbyists are available at reasonable cost, from about $60 up to a few hundred dollars, depending on features. Three different baud rates (speeds) are commonly available: 300, 1200 and 2400 bits per second. (Sometimes the term *baud* is used interchangeably with the term *bits per second.*) This is roughly the same as saying that a modem may send and receive 30, 120 or 240 characters per second.

Naturally, the higher speed modems cost a bit more, but they are usually capable of operation at the lower speed(s) also. For example, a 1200 bits-per-second modem is usually capable of operating at 300 bits per second, while a 2400 bits-per-second modem is usually capable of 300 and 1200 bits-per-second operation, as well.

A 300 bits-per-second modem is all that is really necessary for casually reading messages and electronic mail, but many users prefer the faster throughput of the higher speed modems. Since the price of the higher speed modems is declining almost daily, it will be to your advantage generally to shop for the modem that best suits your anticipated needs. An auto-dialing 1200 bits-per-second modem is probably the most popular at present, although 2400 bits-per-second modems are rapidly becoming an international standard. Popular modems include the Avatex 1200 HC, the Mitsuba, and the Hayes Smartmodem series. Any modem that you consider purchasing should be "Hayes-compatible."

If you plan to operate the modem from the standard CoCo serial port, a special cable is required, one with a four-pin DIN connector on one end and a standard DB-25 connector on the other end. Operation with the Radio Shack Deluxe RS-232 Program Pak is possible with a "straight through" cable

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*Don Hutchison is an electrical engineer and lives in Atlanta, Georgia. He works as a senior project engineer involved in the design of industrial control systems. On Delphi, Don is the Database Manager of the RAINBOW CoCo SIG. His Delphi username is DONHUTCHISON.*

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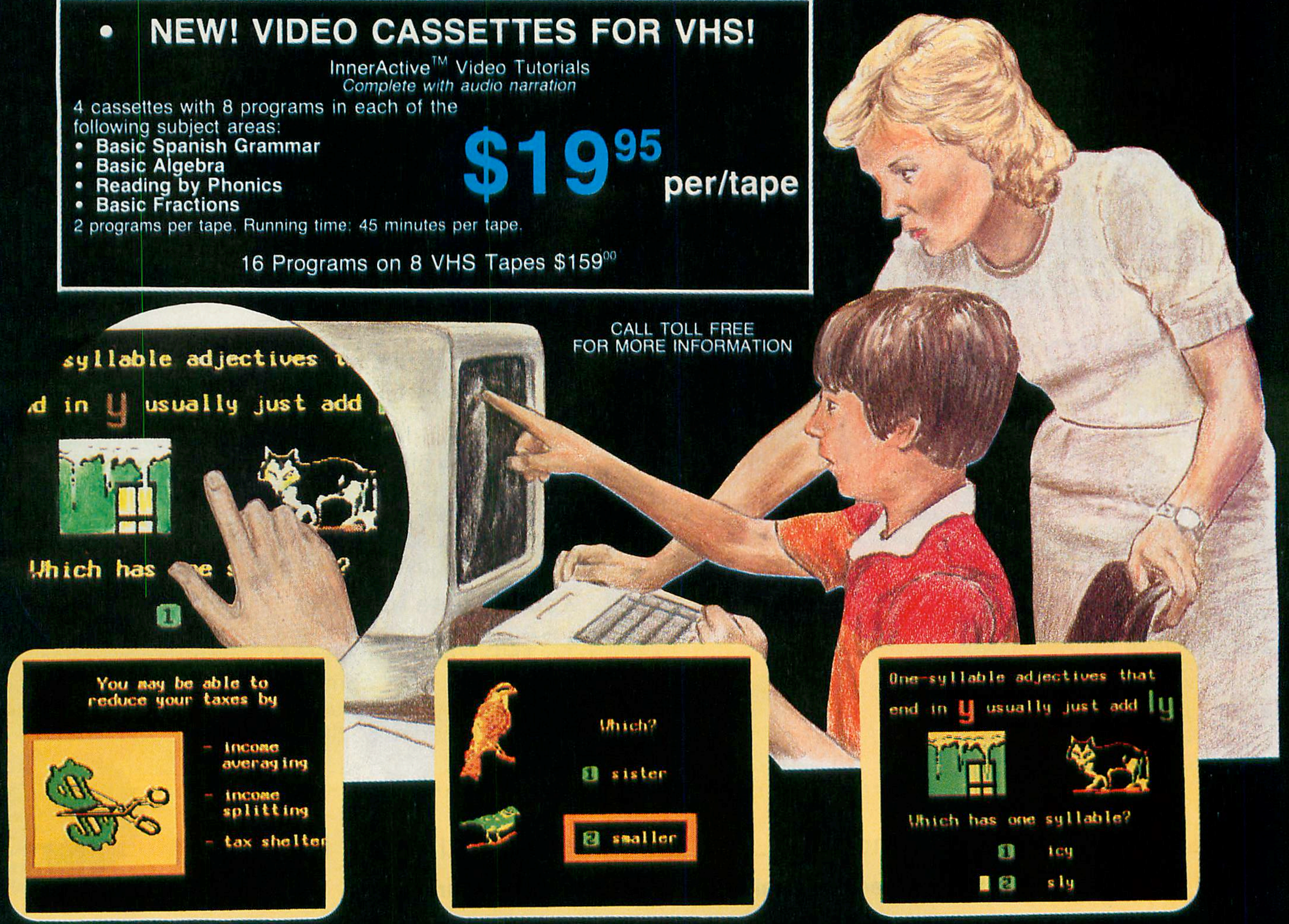

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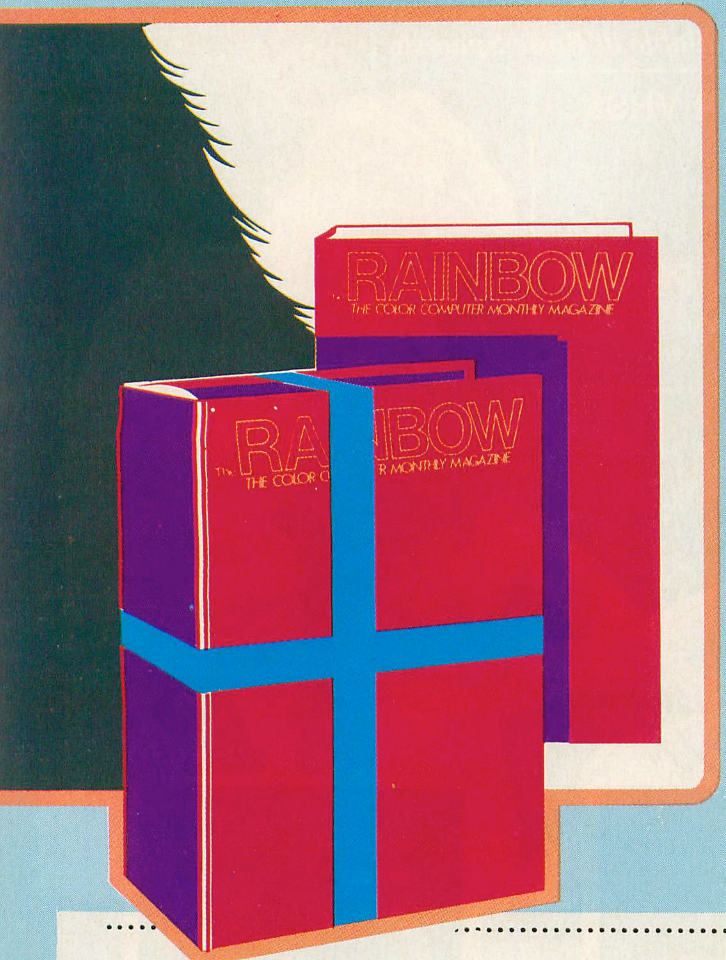
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that has a DB-25 connector on each end.

**What's a terminal program?**

When you use your CoCo with a word processing program such as *Telewriter* or *VIP Writer*, you are using your computer as a sort of electronic typewriter. You type your text on the keyboard and see the result on the screen. When you're finished, you can print your document on a printer.

A terminal program is similar because it allows you to use your CoCo as a terminal. This means that you can type on your keyboard, and your typing will be sent to the remote computers at Delphi. When Delphi sends information to you, the terminal program will accept that information from the modem and display it on your screen.

Make sure that your terminal program is compatible with your chosen modem and optional hardware. Any modern terminal program will operate at 300 bits per second, but some terminal programs may require an RS-232 pack for operation at the higher speeds such as 1200 and 2400 bits per second.

Also, be sure that your chosen terminal program supports a protocol such as Xmodem or Kermit. These features provide error-free file transfers from Delphi to your computer. They do this by sending the data to your computer in small chunks. Following each 128-byte chunk of data is a checksum, which is simply the sum of all the data bytes that Delphi sent to your computer. Your computer then adds up all the data bytes again and compares its result with the one Delphi calculated. If they agree, your terminal program says, "Great! Send me more!"; if they don't agree, your terminal program says, "Uh-oh, please send that again," to the Delphi computer, and it does. In this manner, both computers are constantly checking for errors for you!

All modern terminal programs support Xmodem. Popular commercially available terminal programs include *Autoterm*, *Color Connection* and *ColorCOM/E*, which are priced from $40 to $50 and are available through several RAINBOW advertisers.

OS-9 users generally choose *Xterm* or the *Wiz*. *Xterm* will operate under OS-9 Level I using the standard serial port (a driver for the RS-232 pack is furnished), while the *Wiz* requires a CoCo 3, OS-9 Level II, the Deluxe RS-232 Program Pak and Multipack, and a 512K memory expansion.

Recently, several programmers have written terminal programs to share with others. These terminal programs are called *Rickeyterm*, *Greg-E-Term* and *MikeyTerm* in honor of their respective authors Rick Adams, Greg Miller and Mike Ward. The authors have kindly allowed their terminal programs to be distributed and copied freely by all CoCo users. However, the programs remain the copyrighted works of their authors.

For a minimal $10 charge, these programs may be obtained directly from the author of the individual program. All of the programs are compatible with the CoCo 3, and all feature Xmodem file transfer capability. All are disk-based terminal programs except *MikeyTerm*, which also has provisions to support tape I/O. All three offer reliable communications and dependable operation at a minimum cost.

For the OS-9 user, the most popular terminal program is *XCOM9*, distributed as a public domain terminal program by the national OS-9 Users Group. Several OS-9 terminal programs that support the Kermit protocol are also available through the Users Group.

**Do I have to pay long-distance charges since Delphi is in Massachusetts?**

No. Delphi uses several services called networks to lower the cost of telecomputing. The two most-used networks are named Telenet and Tymnet. These networks buy enormous amounts of telephone time, and may even purchase some of their own telephone equipment. By doing so, they are able to provide users with access to Delphi at rates much lower than long-distance charges.

You may usually connect your computer to one of these networks by dialing a local phone number. To obtain the telephone number for Telenet in your area, call (800) 336-0437. The corresponding telephone number for Tymnet is (800) 336-0149. These are the "customer service" numbers for each network.

**How much does it cost?**

The connect charges are always published online on Delphi, and they are currently $7.20 per hour during the non-prime time hours of 6 p.m. until 7 a.m. local time on weekdays and all day Saturdays and Sundays. (Access at other times is available at a higher rate.) This rate is the same whether you access Delphi at 300, 1200 or 2400 bits per second. You may also use the service offered by Delphi on the following holidays at the non-prime time rate: New Year's Day, Fourth of July, Labor Day, Thanksgiving and Christmas Day. Once you learn your way around on Delphi, you'll find that you can accomplish a great deal in a fairly short period of time.

**What's available on Delphi?**

For one thing, all of the programs that are published every month in THE RAINBOW are available on Delphi! You can download any or all of the programs for just the cost of connect time plus a small surcharge.

All BASIC programs in the RAINBOW ON TAPE topic of the database are stored in compressed or tokenized format, and all binary or machine language programs are stored in disk binary format. This is the same format that would be created if one entered `SAVE(M)` *"filename"* from the keyboard. In other words, the files are created and saved on a disk-based CoCo system.

Cassette users should be aware of this, because special processing is necessary after downloading the RAINBOW ON TAPE files. A special utility called *TAPCNV* has been written by Mike Ward to convert the machine language files into a format that's compatible with tape systems. Mike has written another specialized utility called *BASFIX* that will convert the BASIC programs into a format that may be used by tape systems. Cassette-system users should have both of these utilities available if they plan to download programs from the RAINBOW ON TAPE topic of the database. The programs are available online from the RAINBOW SIG on Delphi, and are found in the utilities topic of the database. (These special steps are not required by owners of disk-based CoCo systems.)

The RAINBOW CoCo SIG on Delphi contains a large library of graphics pictures, especially the high-resolution pictures for the CoCo 3. These pictures are listed with an extension of `MGE` and are meant for use with *Color Max 3*. Hundreds of `PMODE 4` graphics are available online, and these are compatible with the CoCo 1, 2 and 3.

Additionally, many fine utilities, games, music files, assembler source code files, hardware articles, and even specialized educational programs for the home are available from the database. If you have a special need for a certain type of program, you'll most likely be able to find it in the SIG's database.

You also have access to the special areas such as travel information, electronic mail services, financial news and information, and specialized information that is furnished on the specialized areas of Delphi like the CoCo SIG and OS-9 Online.

Also, many vendors maintain online shopping areas on Delphi in the CoCo SIG and OS-9 Online. Here you may order books and other Color Computer products, as well as back issues of RAINBOW and other items.

The RAINBOW CoCo SIG also has a vast number of the CoCo "experts" who frequent the SIG, just waiting for an opportunity to help the novice member. If a user has a nagging question or needs help in a specialized field, personalities such as Rick Adams, Steve Bjork, Kevin Darling, Art Flexser, Erik Gavriluk, Greg Law, Dale Lear, Greg Miller, Mike Ward and myself may be able to help out. Also, many RAINBOW writers are online: such notables as Cray Augsburg, Bill Barden, Dan Downard, Ed Ellers, Richard Esposito, Lonnie Falk, Marty Goodman, Dale Puckett, Jim Reed and Dick White.

**What's downloading?**

Downloading is a way of transferring a program from Delphi's computer to your CoCo. Once the transfer is complete, you may save the program or file to disk or tape. There isn't any need to download a program every time you want to use it.

Downloading is a standard service provided by almost all terminal programs. The better ones also provide methods for monitoring the transfer using special procedures or *protocols* for error detection. This is how Delphi tries to make sure that you get an error-free copy of the program or file. Xmodem is the most popular protocol on Delphi, but terminal programs that support the Kermit protocol may be used also.

Downloading is very easy, and most users find themselves downloading files without difficulty after experiencing their first downloading session. The actual process is initiated by telling Delphi what you want to download by entering a filename, or sometimes by simply entering `DOWNLOAD`. Then a special combination of keystrokes informs your terminal program that you want to download the file. The transfer is then automatic until completion of the download, when the terminal program will ask you a question or two about how to save the information. It's really easy!

**Where can I learn more?**

A great source of information about using Delphi is published in THE RAINBOW. Cray Augsburg, RAINBOW's technical editor, writes a monthly column titled "Delphi Bureau." Each month his column covers another topic related to Delphi. Be sure to read the "Delphi Bureau" every month in RAINBOW.

Also, many Help files are available online. Just type `HELP` at the main prompt of the CoCo SIG or OS-9 Online and you'll be able to access more than 60 special Help modules written for CoCo users.

Online help is provided by the Delphi system itself. Simply entering a "?" at any of the prompts will result in the initiation of a dialogue sequence that's designed to quickly give the user concise, accurate information.

The March '87 issue of RAINBOW featured a copy of the Delphi command card in the "Delphi Bureau" column. This is an extremely useful reference card, and most users will do well to keep it beside their computers for quick help.

Another great reference is the *Delphi Handbook*, which is available directly from Delphi for $29.95, and can be ordered online. The handbook is a very complete source of information about all of the services and features available on Delphi. Another book, *Using Delphi*, will be available for Delphi users later this year.

**What is the Forum for?**

The Forum is for the exchange of information, ideas, hints and tips, and just about anything else that you care to talk about. Here you can ask questions and receive help and information from other CoCo enthusiasts across the nation and around the world. The Forum is like a nationwide electronic bulletin board.

**I've heard a lot about the Conference area. What's that?**

The Conference area is a special feature of Delphi that lets users "talk" to each other in real time. Users can type single-line messages on their computers and the messages will be broadcast to other users in the Conference area. All users are able to reply in the same manner. It is not uncommon for several users from across the country to be seen in Conference.

Conferencing is a great way to hold informal meetings with friends inexpensively, since connect charges are much less than long-distance charges. It is also highly contagious. Once a person is accustomed to the Conference area, he or she prefers to talk frequently with friends from across the country. Some say the nickname "party animal" originally described Delphi Conference-goers.

**What is the database and how is it used?**

The database is where all of the programs and files are stored. It is divided into topic areas, such as Games, Utilities, Graphics, etc. Programs and information are available in the databases, and you may download them for only the cost of connect time to Delphi. We have many, many great programs and text files in the database of the CoCo SIG and OS-9 Online.

**If I download a program from the CoCo SIG or OS-9 Online, may I give my friends a copy?**

No, because almost all of the programs and files in the databases are copyrighted, just as commercial software is copyrighted. You may use anything that you download for your own personal use, and you may make backups of such files for your own use, but you are not allowed to give or sell them to others.

**Isn't it sorta scary?**

No, it's exciting! Just imagine being able to "talk" to people from all across the United States at one time! Imagine having almost 24-hour access to people and information through use of Mail, Conference, and the Forum! It's modern and as fast as the speed of light.

Even if you become totally disoriented your first time online, you may simply disconnect from Delphi and connect again when you're ready. It won't hurt your computer a bit!

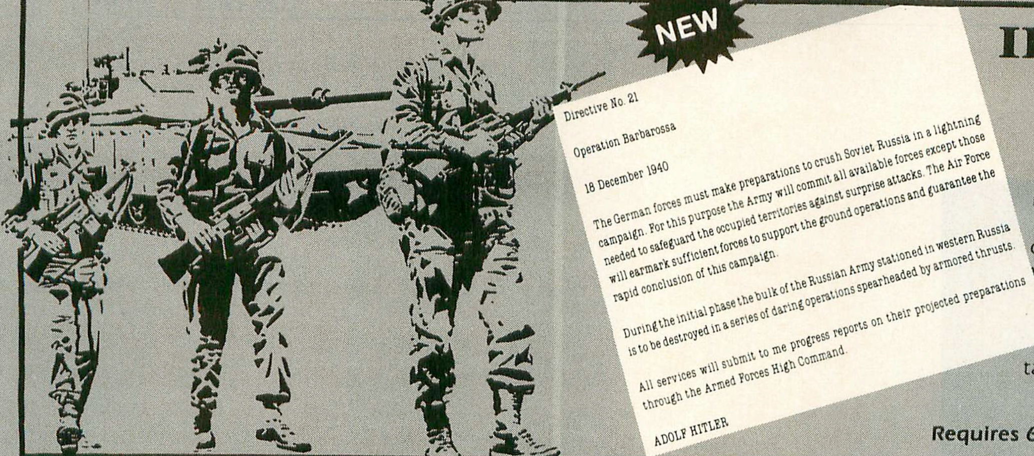
**How do I sign up?**

See the Delphi ad in THE RAINBOW for information on how to sign up for your lifetime membership on Delphi via modem. It's fast and easy, and your first hour online is free! Additional sign-up offers are available at reduced rates. You may use your VISA, Mastercard or American Express card, or you may choose direct-billing with a small deposit.

Be sure to take the "guided tour" when you first sign up, as it will acquaint you with Delphi's major areas quickly. It's well worth the small amount of time for the "tour."

See you online on Delphi!

NEW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18 December 1940

The German forces must make preparations to crush Soviet Russia in a lightning campaign. For this purpose the Army will commit all available forces except those needed to safeguard the occupied territories against surprise attacks. The Air Force will earmark sufficient forces to support the ground operations and guarantee the rapid conclusion of this campaign.

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All services will submit to me progress reports on their projected preparations through the Armed Forces High Command.

ADOLF HITLER

# IRON CROSS

## War in Russia

by John & Michael Galus

The German invasion of Russia began at 0300 on 22 June 1941. Two massive armies faced each other in a titanic struggle which would decide World War II. The object of IRON CROSS is to defeat the Russian forces controlled by the computer & to take control of the Russian cities.

**Requires 64K, Ext. Basic, Disk. $24.95**

## Color Max 3

SAVE

Now 320 x 200 screen resolution & a choice of 16 of the 64 colors are available on your CoCo 3. Painting is a snap with its easy to use icons, pull down menus, & dialog boxes. Color Max 3 has 11 fonts making hundreds of lettering styles possible. Please specify printer type when ordering.

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**by BJ Chambless**

Color Connection for RSDOS and OS-9 Connection are the best in communication software. All standard protocols are supported, including CompuServe Protocol B, XMODEM, and XON/XOFF. The auto dial feature for Hayes compatible and some Radio Shack modems is supported. Macros allow easy entry of often-used passwords and ID's. 300, 1200, and higher baud rates supported. Communicate with confidence with this super modem software!

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| **RSDOS versions (CoCo 2 & CoCo 3 incl)** | **$49.95** |

## OS-9 Tools

### Screen Star

**by Scott Cabit**

This excellent screen editor implements the popular WordStar editing capabilities on OS-9 & includes a unique Speller. Move, copy, or delete blocks of text with one keystroke. Powerful cursor commands allow fast, easy movement throughout the file. The find/replace command makes mass changes & searches a snap. Set tabs, toggle the video, access the OS-9 shell & define up to 10 function keys for fast repetitive functions. And it will edit files larger than memory too! Easy interface with Computerware's Text Formatter makes an exquisite word processing package!

| | |
|---|---|
| **Requires OS-9** | **$49.95** |
| **With Text Formatter** | **$74.95** |

### OS-9 Text Formatter

The OS-9 Text Formatter turns text files into beautifully printed documents. It supports right & left justification, automatic pagination, headers & footers, macros, tabs, page numbering, auto date insert, ESC & CTL codes for printer directives & more. It interfaces with any editor that produces standard ASCII text files like Computerware's Screen Star & Radio Shack's TS Edit. Why just print it when you can format it?!

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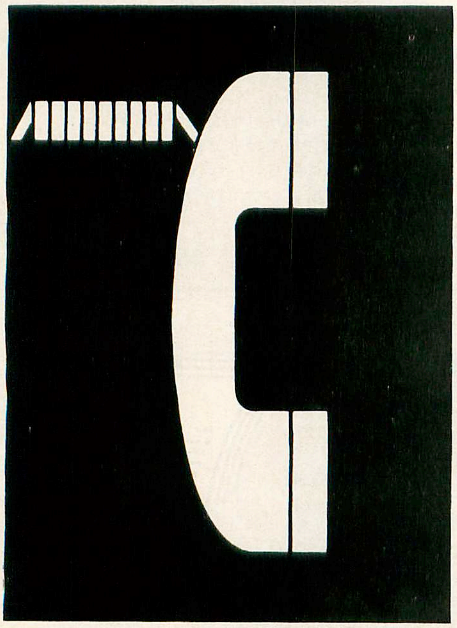


# Let Your CoCo Do the Walking

## By Devon Copley

*A user-friendly database for storing telephone numbers*

*Phone Numbers* is an extensive database for the CoCo that includes many useful and time-saving features and is as user-friendly as possible.

The program is currently configured for disk, but by changing all disk commands to cassette commands, it can easily be adapted to cassette.

*Phone Numbers* uses almost all available memory for the program and data storage. However, more can be accessed by a `PCLEAR 1` command. I have found the memory available at `PCLEAR 4` more than adequate for all applications.

**Input Numbers and Names**

This option allows you to enter the data the program will use. When you enter this routine, you will be asked for the default area code. This code will be used if you do not specify an area code when entering a number. If you enter a number with an area code different from the default, you must use the format (XXX) XXX-XXXX. Otherwise, simply use the format XXX-XXXX.

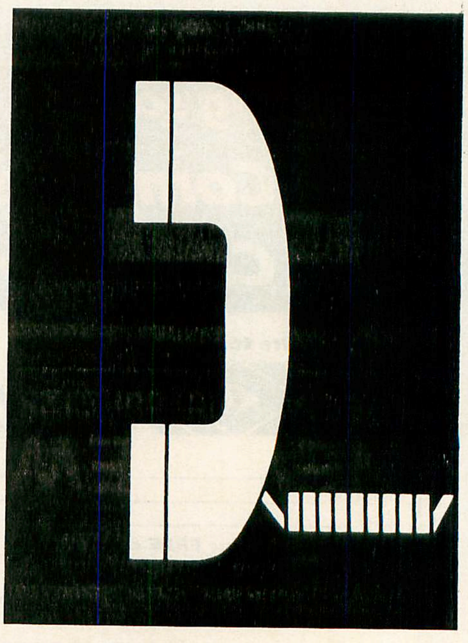
After you enter the numbers, the computer will give you five prompts. The Name, Number and Comment prompts are self-explanatory. If you simply press ENTER at the comment prompt, the computer will display the word "none" automatically.

**List All Numbers**

This command sends the computer through all the numbers in the current file, one by one. You are then asked for

---

*Devon Copley has been using his CoCo for over six years and lives in Amherst, New York. This is his first full-length program for* THE RAINBOW.



# Data Master

*from the same people who brought you Data Bank & OS-9 Profile . . .*
*a new level of sophistication and ease of use in data base systems!*

**by BJ Chambless**

**$64.95**

### Simplify steps with pull-down menus

Throw down the shackles of rigid menu hierarchies and see how simple our pull-down menu system is to use. All options are available from anywhere in the program. So what if you're designing a report, if you want to change your access key you can do it right then and there without exiting back and forth through several levels of menus and options. To make it even simpler, each menu option can be invoked by a single character!

### Dialog boxes

Pop-up windows display current settings (display, access, print) and available choices for fast changes of any option.

### Unique LIST (spreadsheet) display format

A unique *LIST* display format lets you view data in easy-to-read rows & columns. Simply choose which elements from the record you want to see and **Data Master** displays them in a simple, one record per line, spreadsheet-like format.

From this easy-to-read screen you may edit your data right there, without having to exit the display menu, enter an edit menu, and edit each individual record. Mass changes are a snap!

For even more power, use an access key to selectively display a subset of records from your data base. Now you see only the chosen elements, in the chosen records, in a very simplified screen format – and can change them right on the screen!

### Upload/Download with other software

**Data Master** can read and write standard sequential files which aids in data transfer between DynaCalc and many other programs.

### OS-9 Profile & Data Bank Compatibility

Your OS-9 Profile and Data Bank files are compatible with the new power of **Data Master**. You won't lose any of your valuable data when you step up to **Data Master**!

### Easy Expansion

Re-definition of records and transfer of files is made easy, allowing you flexibility when designing a new data base or when using an old one for new tasks.

### Elements & Records:

Each record can contain up to 512 characters used within 35 elements. Elements are defined as: *alphanumeric* (descriptive data), *math* (real numbers including dollars & cents), *date*, and *derived* (formulas calculated from other elements in the same record). You can store any type of data using these field types!

### Display & Entry Screens

Design up to 9 different screen formats for data display and data entry for each data base. This is helpful for accessing your data for different purposes as well as in easy data entry of specific elements.

### Sorts & Selections:

Up to 9 different access keys can be defined. These are used for displaying data on the screen or selecting data for printing. You may use several levels of sorts as well as logical operators to select just the right data. A powerful generic search is also available.

### Reports:

See your data any way you want by designing your own reports! **Data Master** offers easy-to-use tools to design professional reports including report headings, titles, column headings, automatic page numbers, column totals, and more. Store up to 9 report formats for each data base. At print time use the powerful access keys to select the data printed on any report format.

### File Management

Built-in file management capabilities allow easy file manipulation for transferring data files, renaming data files, expanding data files, and more. This integrated function is easy to use and available from the simplified pull-down menu system.

### Full keyboard ease

**Data Master** takes full advantage of the CoCo 3's cursor and function keys.

### OS-9 accessible

Even while operating within **Data Master**, you can invoke OS-9 commands.

**Requires: OS-9 Level II, CoCo 3, 512K**

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a time delay between numbers; I find a value of 50 comfortable.

**Search for Name**

When you enter this subroutine, the program simply asks you for a name. It then searches through all of the files; if there is a file under that name, the computer shows it to you. Then the program returns you to the main menu.

**Search for Number**

This routine is very powerful. One of the things it does is find a file from just the number you entered. However, if you used X's instead of numbers for some of the digits, the computer allows any digit to fit into that place. For example, if you enter (555) XXX-XXXX, the computer finds any and all numbers with the area code 555. You can use this routine to find all the numbers in one exchange. For instance, entering (555) 000-XXXX retrieves all numbers with the area code 555 and the exchange 000.

**Dump All Numbers to Printer**

This option allows you to print out the entire numbers file. It adjusts itself to your printer's line length and allows you to decide whether you want single-spaced or double-spaced copy. It also lets you decide whether to print comments or not.

**Change Name, Number or Comment**

This subroutine is simply a time-saving feature. If, for instance, one of the people on file had his or her telephone number changed, you could use this option to change the number on file without altering any of the other information. The program also allows you to change the name or the comment.

**Delete Name and Number**

This subroutine asks you for both the name and the number of the file you want to delete. For instance, if you had two people named "John Smith" in your file, you could easily choose the correct one to delete.

**Save Numbers File**

This option allows you to save the entire numbers file to disk under any filename you want.

**Load Numbers File**

This option allows you to load in a numbers file, under any desired filename, from disk.

**Exit Program**

This ends the program with a `STOP` statement. However, if choosing this option was a mistake, you can return to the program without losing any data by typing `CONT` and pressing `ENTER`.

**Clear Memory**

After you select this option, the computer will give you a warning message asking if you really want to erase all of your data. Anything but the entire word "yes" returns you to the main menu.

---

*(Questions about this program may be directed to the author at 88 Ruskin Road, Amherst, NY 14226. Please enclose an SASE when writing for a reply.)* ☐

| | | | |
|---|---|---|---|
| 250 | ......140 | 1060 | .....191 |
| 330 | ......160 | 1250 | .....189 |
| 510 | ......244 | 1410 | ......25 |
| 730 | .......61 | END | ......59 |
| 900 | ......188 | | |

**The listing:** `NUMFILE`

```
10 REM *****PHONE NUMBERS******
20 REM *****BY DEVON COPLEY*****
30 REM STARTED  1/24/85
40 REM FINISHED 1/26/85
50 REM REVISED  4/13/85
60 CLEAR 12000
70 TN=0:DIM NA$(255),NU$(255),NO
$(255)
80 REM MAIN LOOP
90 CLS
100 PRINT"**********PHONE NUMBER
S*********"
110 PRINT"1)INPUT NUMBERS AND NA
MES"
120 PRINT"2)LIST ALL NUMBERS"
130 PRINT"3)SEARCH FOR NAME"
140 PRINT"4)SEARCH FOR NUMBER"
150 PRINT"5)DUMP ALL NUMBERS TO
PRINTER"
160 PRINT"6)CHANGE NAME,NUMBER,O
R COMMENT"
170 PRINT"7)DELETE NAME AND NUMB
ER"
180 PRINT"8)SAVE NUMBERS FILE"
190 PRINT"9)LOAD NUMBERS FILE"
200 PRINT"10)EXIT PROGRAM"
210 PRINT"11)CLEAR MEMORY"
220 PRINT:IF A$="" THEN A$="IN M
EMORY ONLY"
230 PRINT"CURRENT FILE:"A$
240 INPUT"SELECT ONE";I
250 IF I=11 THEN CLS:PRINT"you a
re about to clear memory.  this
will erase all files in    memor
y.":PRINT"IF YOU WISH TO DO THIS
, TYPE THEENTIRE WORD 'YES' NOW.
 ANYTHING ELSE WILL TAKE YOU BAC
K TO THE  MENU."
260 IF I=11 THEN LINEINPUT Z$:IF
 Z$="YES" THEN RUN
270 IF I=10 THEN CLS:PRINT"TYPE
'CONT' TO GO BACK INTO THE PROGR
AM WITHOUT LOSING YOUR     DATA.
":STOP
280 IF I<0 OR I>9 THEN 90
290 IF ((I>1 AND I<>9)AND TN<2)
THEN CLS:PRINT"MORE THAN ONE REC
ORD IS REQUIREDTO USE THIS OPTIO
N.":GOSUB 1640:GOTO 90
300 ON I GOSUB 320,500,610,730,8
70,1050,1220,1390,1530
```

```
310 GOTO 90
320 CLS:PRINT"        INPUT NUMBERS
 AND NAMES":PRINT:PRINT
330 PRINT"BE SURE TO USE THE COR
RECT FOR- MAT WHEN TYPING IN PHO
NE NUM-   BERS. HERE IS AN EXAMP
LE:           (555)-555-5555
"
340 PRINT"IF NO AREA CODE IS SPE
CIFIED,   THE DEFAULT AREA CODE
WILL BE   USED."
350 PRINT:INPUT"WHAT IS THE DEFA
ULT AREA         CODE";AC$:IF LEN
(AC$)<>3 THEN 350
360 AC$="("+AC$+")-"
370 GOSUB 1640:CLS
380 X=TN:IF TN=0 THEN X=1
390 PRINT:PRINT:INPUT"NAME";NA$
400 INPUT"NUMBER";NU$
410 IF LEN(NU$)<8 THEN 400
420 IF LEN(NU$)=8 THEN NU$=AC$+N
U$
430 IF MID$(NU$,10,1)=" " THEN M
ID$(NU$,10,1)="-"
440 IF MID$(NU$,6,1)=" " THEN MI
D$(NU$,6,1)="-"
450 INPUT"COMMENT";NO$:IF NO$=""
 THEN NO$="NONE":PRINT@137,NO$:E
LSE PRINT
460 PRINT:INPUT"CORRECT";C$:IF L
EFT$(C$,1)="N" THEN 390
470 NU$(X)=NU$:NA$(X)=NA$:NO$(X)
=NO$
480 TN=TN+1
490 INPUT"MORE FILES";C$:IF LEFT
$(C$,1)="N" THEN RETURN ELSE X=X
+1:CLS:GOTO 390
500 CLS:PRINT"          LIST ALL N
UMBERS"
510 PRINT:INPUT"SPEED DELAY(0-10
0)";D:IF (D<0 OR D>100) THEN 510
520 D=D*10
530 PRINT:PRINT
540 FOR X=1 TO TN
550 CLS
560 PRINT:PRINT"NAME:";NA$(X):PR
INT:PRINT"NUMBER:";NU$(X):PRINT:
PRINT"COMMENT:";NO$(X)
570 PRINT
580 FOR TD=1 TO D:NEXT TD
590 NEXT X
600 GOSUB 1640:RETURN
610 CLS:PRINT"          SEARCH FOR
 NAME"
620 PRINT:INPUT"ENTER NAME";NA$
630 FOR X=1 TO TN
640 IF NA$(X)=NA$ THEN 680
650 NEXT X
660 PRINT"SORRY, THAT NAME IS NO
T IN THE  FILE.":GOSUB 1640
670 RETURN
680 PRINT"NAME:";NA$(X)
690 PRINT"NUMBER:";NU$(X)
700 PRINT"COMMENT:";NO$(X)
710 GOSUB 1640
720 RETURN
730 CLS:PRINT"        SEARCH FOR
NUMBER"
740 PRINT:PRINT"ENTER NUMBER TO
SEARCH FOR. BE  SURE TO INCLUDE
ALL DASHES."
750 PRINT"ENTERING 'X' INSTEAD O
F A DIGIT WILL ALLOW ANY DIGIT I
N THAT    PLACE.":LINEINPUT NU$
760 NP=0
770 FOR X=1 TO TN
780 NN$=NU$(X)
790 FL=0:IF LEN(NU$)<>LEN(NN$) T
HEN NEXT X
800 FOR Y=1 TO LEN(NU$):IF MID$(
NU$,Y,1)=MID$(NN$,Y,1) THEN FL=F
L+1:ELSE IF MID$(NU$,Y,1)="X" TH
EN FL=FL+1
810 NEXT Y
820 IF FL=LEN(NU$) THEN CLS:PRIN
T:PRINT"NAME:"NA$(X):PRINT:PRINT
"NUMBER:"NU$(X):PRINT:PRINT"COMM
ENT:"NO$(X):NP=NP+1
830 IF FL=LEN(NU$) THEN GOSUB 16
40
840 IF X<TN THEN NEXT X
850 IF NP<>0 THEN RETURN
860 PRINT"SORRY, THAT NUMBER IS
NOT IN THEFILE.":GOSUB 1640:RETU
RN
870 CLS:PRINT"    DUMP ALL NUMBER
S TO PRINTER"
880 PRINT:PRINT"PRINT COMMENTS(Y
/N)";:INPUT I$
890 IF LEFT$(I$,1)="Y" THEN CO=1
 ELSE CO=0
900 PRINT:INPUT"DOUBLE SPACED(Y/
N)";I$:IF LEFT$(I$,1)="Y" THEN D
S=1 ELSE DS=0
910 PRINT:PRINT"PRESS 'P' TO PRI
NT NOW, OR ANY  OTHER KEY TO RET
URN TO THE MENU."
920 X$=INKEY$:IF X$="" THEN 920
930 IF X$<>"P" THEN RETURN
940 PRINT:INPUT"HOW MANY CHARACT
ERS ACROSS DOES YOUR PRINTER HAV
E";CA
950 PRINT"PRINTING..."
960 FOR X=1 TO TN
970 PRINT#-2,NA$(X);
980 FOR GG=1 TO CA-(LEN(NA$(X))+
LEN(NU$(X))):PRINT#-2,".";:NEXT
GG
990 PRINT#-2,NU$(X)
1000 IF CO=1 THEN PRINT"COMMENT:
"NO$(X)
1010 IF DS=1 THEN PRINT#-2,""
1020 NEXT X
1030 PRINT"DONE!":GOSUB 1640
1040 RETURN
1050 CLS:PRINT"      CHANGE NAME
OR NUMBER"
1060 PRINT:INPUT"ENTER NAME OR N
UMBER TO SEARCH  FOR";NN$
1070 FOR X=1 TO TN
1080 IF (NN$=NA$(X) OR NN$=NU$(X
)) THEN 1100 ELSE NEXT X
1090 PRINT"SORRY, THAT NAME/NUMB
ER IS NOT  IN THE FILE.":GOSUB 1
640:RETURN
1100 PRINT"NAME:"NA$(X)
1110 PRINT"NUMBER:"NU$(X)
1120 PRINT"COMMENT:"NO$(X)
1130 PRINT:INPUT"DO YOU WANT:
                  1) A NEW NAME F
OR THE FILE       2) A NEW NUMBER
 FOR THE FILE     3) A NEW COMMEN
T FOR THE FILE    4) RETURN TO TH
E MAIN MENU       PICK ONE";IN:IF
(IN>4 OR IN<1) THEN 1130
1140 IF IN=4 THEN RETURN
1150 ON IN GOTO 1160,1180,1200
1160 PRINT:INPUT"NEW NAME";NA$(X
)
1170 GOSUB 1640:RETURN
1180 INPUT"NEW NUMBER";NU(X)
1190 GOSUB 1640:RETURN
1200 INPUT"NEW COMMENT";NO$(X)
1210 GOSUB 1640:RETURN
1220 CLS:PRINT"      DELETE NAME
AND NUMBER"
1230 PRINT:PRINT"ENTER NAME";:IN
PUT NA$
1240 INPUT"ENTER NUMBER";NU$
1250 PRINT"SEARCHING..."
1260 FOR X=1 TO TN
1270 IF(NA$(X)=NA$ AND NU$=NU$(X
)) THEN 1290 ELSE NEXT X
1280 PRINT"THERE IS NO FILE UNDE
R THAT NAMEAND NUMBER.":GOSUB 16
40:RETURN
1290 PRINT"NAME:"NA$(X)
1300 PRINT"NUMBER:"NU$(X)
1310 PRINT"COMMENT:"NO$(X)
1320 PRINT:PRINT"STILL WANT TO D
```

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```
ELETE(Y/N)";:INPUT IN$:IF LEFT$(
IN$,1)<>"Y" THEN RETURN
1330 PRINT"DELETING..."
1340 FOR Y=(X+1) TO TN
1350 NA$(Y-1)=NA$(Y):NU$(Y-1)=NU
$(Y):NO$(Y-1)=NO$(Y)
1360 NEXT Y
1370 TN=TN-1
1380 GOSUB 1640:RETURN
1390 CLS:PRINT"          SAVE NUMB
ERS FILE"
1400 PRINT:PRINT"THIS OPTION WIL
L SAVE TWO FILES.THE FILENAME YO
U ENTER, AND A   BACKUP."
1410 PRINT:LINEINPUT"HIT <ENTER>
 TO START SAVING, OR <R> AND <EN
TER> TO RETURN TO THEMENU.";IN$
1420 IF IN$="R" THEN RETURN
1430 INPUT"FILENAME";A$
1440 FOR GG=1 TO 2
1450 IF GG=1 THEN OPEN"O",#1,A$:
ELSE A$=A$+".BAK":OPEN"O",#1,A$
1460 WRITE#1,TN
1470 FOR X=1 TO TN
1480 WRITE#1,NA$(X),NU$(X),NO$(X
)
1490 NEXT X
1500 CLOSE
1510 NEXT GG
1520 GOSUB 1640:RETURN
1530 CLS:PRINT"          LOAD NUMBE
RS FILE"
1540 PRINT:LINEINPUT"HIT <ENTER>
 TO LOAD OR <R> AND  <ENTER> TO
RETURN TO THE MAIN   MENU.";IN$
1550 IF IN$="R" THEN RETURN
1560 INPUT"FILENAME";A$
1570 OPEN"I",#1,A$
1580 INPUT#1,TN
1590 FOR X=1 TO TN
1600 INPUT#1,NA$(X),NU$(X),NO$(X
)
1610 IF EOF(1)=-1 THEN 1620 ELSE
 NEXT X
1620 CLOSE:GOSUB 1640:RETURN
1630 END:REM END OF PROGRAM AND
MAJOR SUBROUTINES
1640 PRINT@480,"      PRESS ANY KE
Y TO CONTINUE";
1650 X$=INKEY$:IF X$="" THEN 165
0
1660 RETURN
```

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# Upgrading Keyboard Skills

## By Steve Blyn
## Rainbow Contributing Editor

This month's article features a program for kids of all ages and grade levels. Even many of our readers who are long past their school years may benefit from it. The program, *Quickie Typing Tutor*, will help students sharpen their keyboard skills.

We have found that too many students and even adult computer users still have very poor keyboard skills. It is often such an effort to type in short programs or class assignments and compositions that the computer remains unused. It sometimes becomes a monumental chore merely to type a few paragraphs. This problem should be addressed and corrected as early as possible.

To add a little controversy to this issue, there is some debate as to whether the correct use of typewriter fingering should always be insisted upon. My feeling is that typing courses are extremely useful to computer usage. Unfortunately, they are not always offered to students, or not always at a time concurrent with computer keyboard use. Therefore, I am not convinced that correct fingering should always be required.

Lately, I have seen a number of students who have independently developed their own keyboard fingering systems because they had no formal typing course available. Their methods are all individual. They involve two or four or almost any number of the 10 fingers. Some of these students can use the keyboard quite swiftly and accurately. I feel that they should be commended and not deterred, unless a formal typing program can be offered. Not everybody agrees on this issue, however.

Our program presents sentences to be typed by the user. The program then checks to see if the sentence was copied correctly, with the results immediately shown at the bottom of the screen. After each sentence is typed, the student may press ENTER to get a new sentence or the E key to end the program. *Quickie Typing Tutor* may be played endlessly until the student either masters the sentences or tires of practicing. The current score is always displayed.

Lines 80 through 110 draw a picture of the computer keys used. Line 140 randomly selects a sentence from the `DATA` statements. The sentence selected is `A$(R)`. The student's typed sentence is obtained from the `LINEINPUT` in Line 160; this becomes `B$`. Lines 180 and 190 compare the two and tell if the typed sentence matches the computer-selected sentence. Line 200 updates the score.

Included are 20 sample sentences for practice. These samples are only a starting point. After these 20 are sufficiently mastered or memorized, replace them with 20 of your own.

You may want to include more than 20 `DATA` statements. I recommend you put in 50 to 100 sentences to make the program more challenging. People are creatures of habit and like to win. Therefore, you may expect that with only 20 sentences to learn, many users will begin to memorize them. This puts those who don't memorize the sentences easily at a disadvantage.

A further step in the process of attaining better keyboard skills simply involves applying masking tape over all or some of the keys. You are forced to learn the placement of the keys if you cannot see them. I have mixed emotions on this technique and, therefore, leave it to you to decide if you would like to try it.

As always, we at Computer Island enjoy hearing your thoughts on the ideas and programs presented in this column. ☐

---

*Steve Blyn teaches both exceptional and gifted children, holds two master's degrees and has won awards for the design of programs to aid the handicapped. He owns Computer Island and lives in Staten Island, New York.*

**The listing:** `TYPING`

```
10 REM"QUICKIE TYPING TUTOR"
20 REM"STEVE BLYN,COMPUTER ISLAN
D,STATEN ISLAND,NY,1987"
30 N=20:K=RND(-TIMER):DIM A$(20)
40 FOR T=1 TO N:READ A$(T):NEXT
T
50 CLS:R=RND(N)
60 PRINT@0," R=";C"
     W=";W
70 PRINT@36,"* QUICKIE TYPING TU
TOR *";
```

```
80 A1$="1 2 3 4 5 6 7 8 9 0 : -
"
90 A2$=" Q W E R T Y U I O P @
100 A3$="  A S D F G H J K L ;"
110 A4$="   Z X C V B N M , . /
"
120 PRINT@99,A1$:PRINT@131,A2$:P
RINT@163,A3$:PRINT@195,A4$
130 PRINT@64,STRING$(32,239);:PR
INT@224,STRING$(32,239);
140 PRINT@256,A$(R)
150 PRINT@320,"";
160 LINEINPUT B$
170 PRINT@384,STRING$(32,224);
180 IF B$=A$(R) THEN PRINT@426,"
CORRECT":PLAY"L150CDEGGGG":C=C+1
190 IF B$<>A$(R) THEN PRINT@427,
"SORRY":PLAY"L8G-":W=W+1
200 PRINT@0," R=";C"
        W=";W;
210 PRINT@488,"PRESS ENTER";
220 EN$=INKEY$
230 IF EN$=CHR$(13) THEN 50 ELSE
 IF EN$="E" THEN END ELSE 220
240 REM"HERE ARE 20 REPLACEABLE
DATA STATEMENTS TO GET HELP GET
YOU STARTED"
250 DATA THE RAINBOW IS A MAGAZI
NE.,LONNIE FALK IS THE OWNER OF
THE RAINBOW.
260 DATA THIS IS A TEST TO SEE H
OW WELL  YOU CAN TYPE SENTENCES.
270 DATA CAN YOU TYPE WELL?,MY F
INGERS DON'T HURT MUCH.
280 DATA HOW ARE YOU FEELING ON
THIS FINEAUTUMN DAY?,I FEEL FINE
 TODAY.
290 DATA THIS SENTENCE  WILL GO
PAST THE FIRST LINE.
300 DATA THEY ARE COMING HERE FO
R LUNCH.,CAN YOU WASH THE DISHES
?
310 DATA WHEN ARE YOU GOING HOME
?,WILL YOU BE BACK TOMORROW?
320 DATA I LIKE TO WATCH JOHNNY
CARSON.,BUGS BUNNY IS MY FAVORIT
E CARTOON.
330 DATA SPIDERMAN HAS SPECIAL P
OWERS.,MADONNA IS MY FAVORITE SI
NGER.
340 DATA MY CLASS HAS 8 COLOR CO
MPUTERS.,I CAN'T WAIT FOR THANKS
GIVING.
350 DATA I AM GOING TO THE MOVIE
S LATER.,I WILL SEE A GOOD PICTU
RE SHOW.
```

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# Caught Up in a Galactic Conflict

### By Paul Alger

You are the skipper of a fleet of vessels in deep space. Your mission: To colonize uncharted planets, establish bases, transport cargo, and let no one stand in your way. You check the ship's long-range scanner to find enemy fleets converging on your position. You deploy a squadron of fighters to intercept the enemy. A red alert is sounded. Flagship defenses go automatic. The battle begins. . . .

*Galactic Conflict* is a multi-player BBS game for up to 40 players. It will work as a stand-alone BBS using *Remote2*, or it can be easily modified to work with most CoCo-based 32K BBS systems. To date, the game has topped 500 calls and has proven to be quite popular, serving as an alternative to the normal BBS functions of reading and writing posts.

The game is played on several levels, each level a grid of predetermined size. The SysOp sets the size of the grid and the number of levels at the start of the game. This way, the SysOp can allocate as much disk space as he has available, or make each game different for the users.

When the galaxy is small, its resources run out quickly, and the users are forced to war with each other. If the galaxy is large, there are plenty of resources to go around, and the game is usually won quickly. A typical galaxy size is a 20-by-20 grid with four levels. This gives the players 1,600 sectors to explore.

**Getting Started**

*Galactic Conflict* requires a minimum of 15 granules of disk space: nine for the program, four for the user data file, at least one for the galaxy, and one for the rules. You should allow at least one granule for each level in the game. For example, a 20-by-20 grid with four levels would use a total of 18 granules.

Type in Listing 1, `NEWGAME`, and run it. This program creates all of the data files needed for the game. You will be prompted to select the size of the grid and number of levels. When the data files are made, you have the option of setting up the number of planets, robodroids, etc., that is held in each level. Remember that a 20-by-20 grid contains 400 sectors and the total items in each level cannot exceed that number. Here is a typical setup for Level 1:

| Prompt | Typical response |
|---|---|
| Enter number of planets with cargo | 250 |
| Enter number of Robodroids | 40 |
| Enter number of Stargates | 40 |
| Enter number of ? | 40 |

In the above example, 370 out of 400 sectors will have items of value, while the remaining 30 sectors will be neutral planets with no cargo.

These steps are repeated for each level. In this way, the SysOp can make each level different. I usually set up one level as nothing but Robodroids and '?'. Use your imagination.

**Playing the Game**

Once the data files and the galaxy are in place, type in Listing 2, `GALACTIC`. Then save the program to disk and enter the following:

```
LOADM"REMOTE2"
EXEC
PCLEAR1
RUN"GALACTIC"
```

Press ENTER again and log on the game as new. When the logon process is complete, use any of the following commands to play the game.

`NAV`. The Navigation command allows your fleet to move from sector to sector within the current level. When the Nav option is selected, you will be prompted to enter a direction (1 to 8). The direction of travel is as follows:

1) up, or north
2) up and right, or northeast
3) right, or east
4) down and right, or southeast
5) down, or south
6) down and left, or southwest
7) left, or west
8) up and left, or northwest

Any other value will abort the Nav command. When a direction of travel is selected, you will be prompted to enter a Warp factor (1 to 8). Warp 1 will move you one sector while Warp 8 will move you eight sectors.

`SRS`. The Short-Range Scan will list what is contained in the sector you are currently in.

`LRS`. If you have purchased a scanner, the Long-Range Scan will allow you to look beyond the sector you are in. The more scanners you have, the farther you

---

*Paul Alger holds a bachelor's degree in audio engineering and is currently working as a professional musician. He also runs The Time Machine BBS at (509) 586-2559 which in online 24 hours a day at 300 baud.*

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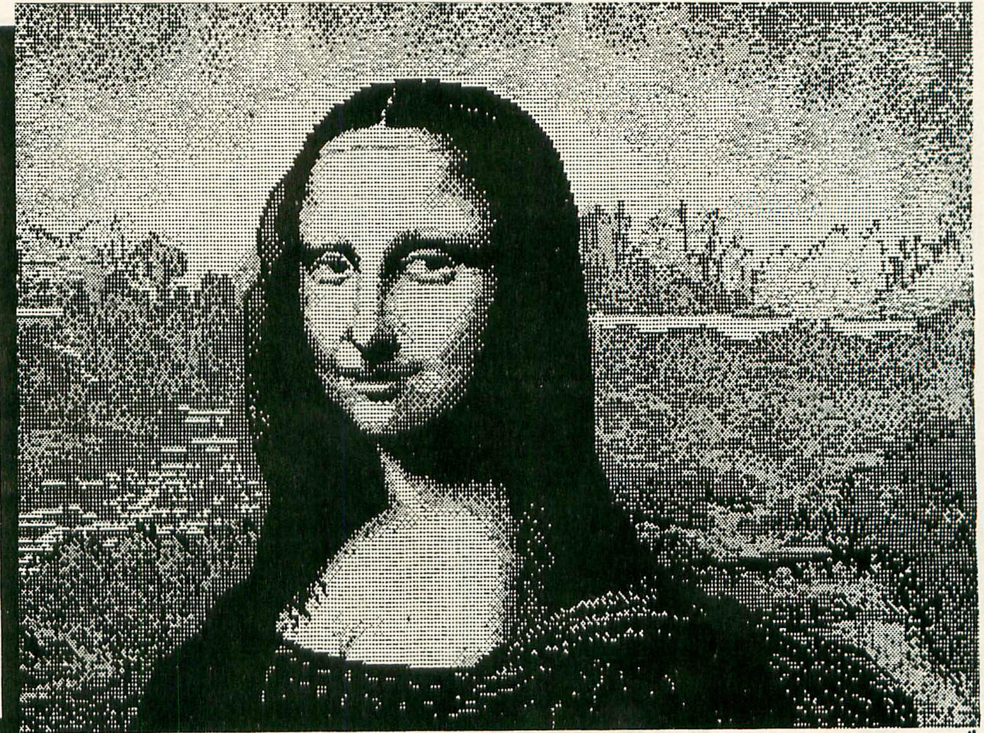

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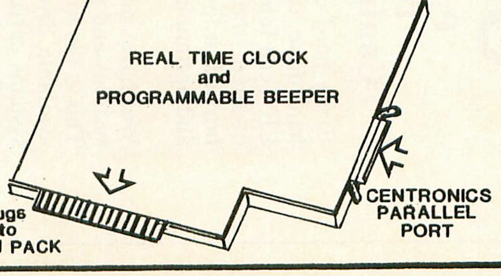

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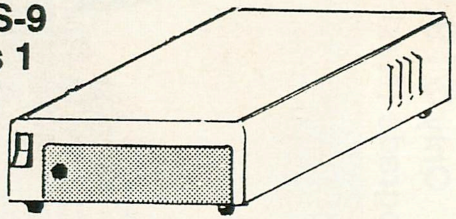

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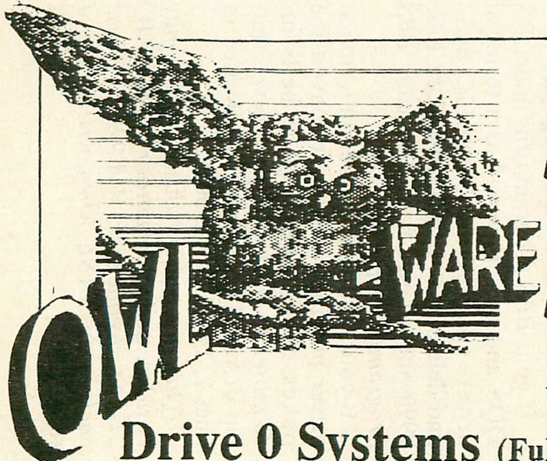

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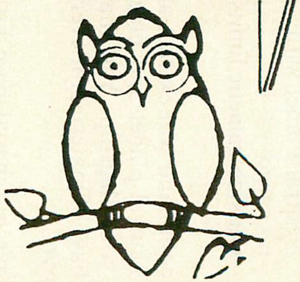

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can scan. These symbols are used to identify objects in other sectors:

| Symbol | Object |
|---|---|
| Up arrow | Your Current position |
| E | Enemy Planet |
| # | Enemy Fleet |
| R | Robodroid (computer-controlled enemy) |
| ? | Chance (could be good or bad) |
| S | Stargate |
| $ | Your base |
| T | Trading Base |
| 1-7 | Neutral Planet with cargo |
| 0 | Neutral Planet with no cargo |
| * | Outside galactic limits |

`GET`. The Get command will extract all cargo from a neutral planet and place the cargo on your flagship. You may hold 10 cargo bays of material for every flagship you own.

`BUI`. If you have purchased base kits, the Build command will build bases on a neutral planet. Once built, the bases will provide you with money at the start of each turn.

`TRA`. If there is a trading base located at your current position, the Trade command will allow you to buy and sell goods. There is a bank located at each trading base.

`WAR`. If you run across any enemy bases or an enemy fleet, you may declare War on that planet or fleet. Once war is declared, you must deploy fighters to fight the battle for you.

`TLP`. If there is a stargate located at your current position, the TLP command will teleport your fleet to any position in the current level.

`LST`. The LST command will list all players in the game.

`LVL`. This command allows you to switch from one level to the next. The higher the level, the more bases you can build on a single planet. Robodroids get tougher on higher levels, as well.

`STA`. The Status command will show your current status.

`TOP`. This command will show you the top five players.

`CAL`. This will list out the last nine callers who have played the game.

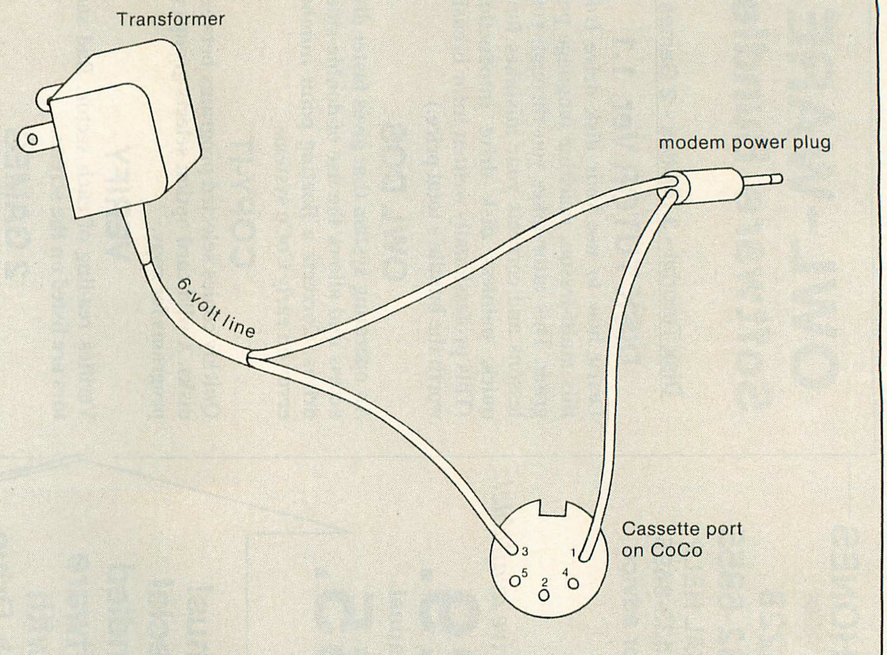

**Figure 1: Hooking up modem power through cassette relay**

`RUL`. This will list out a text file called `RULES`. You should write up a condensed list of rules and save it to the BBS disk as `RULES.TXT`.

`END`. This command ends your turn.

### Rules of Play

You may extract cargo from any neutral planet or your own planet, but not from an enemy planet. If cargo is found on an enemy planet, you must take over the base(s) first, then extract the cargo.

If you end your turn in any sector but your own base, your fleet will be teleported to a neutral sector and a base will be built there. The bank builds the base for you and charges you double the price to build it. The price of the base is added on to your loan amount.

There are several more rules to the game, but I will let you find them out as you play.

If you do not want to allow back-to-back calls, remove the `REM` in Line 162.

### Notes for Multi-Drive Users

If you have more than one disk drive and want to move the data files to another drive, use the following steps:

1) `LOAD "NEWGAME"`
2) Insert the data disk into Drive 0
3) Run the program and set up the galaxy
4) `LOAD "GALACTIC"`
5) Edit the following lines, inserting the proper drive number: 280, 2010, 2110, 4900, 7020 and 7050
6) `SAVE "GALACTIC.BAS"`

### Hints

To prevent BBS crashers from breaking into BASIC, I have the power to my modem going through the cassette relay. If, for some reason, the program produces an error and the game breaks into BASIC, the modem shuts off and will not allow further calls until the problem is fixed. This protection is crude, but very effective. To use this option, you must have a modem that uses a transformer which changes 110VAC to some small voltage between 6 and 12 volts. *Do not attempt to run 110V through the cassette relay!* (See Figure 1.)

### Use with Another BBS Program

If your BBS program runs under RS DOS and uses *Remote2* as a terminal driver, enter `LOAD "GALACTIC.BAS"` and delete lines 1 through 6. Edit Line 9999 and change it to `RUN"`*your BBS program filename*`"`.

If your BBS uses a different terminal driver program, you must convert the pokes used to change the bells on *Remote2* to work with your new terminal driver. These pokes are located in lines 2, 140, 160 and 5010.

*(Questions about this program may be addressed to the author at 1811D W. 21st St., Kennewick, WA 99337. Please enclose an SASE when writing for a reply.)* ☐

*Editor's Note:* REMOTE2 *appeared on Page 106 of the November 1985 issue of* THE RAINBOW. *For information about the program, or if you wish to assemble* REMOTE2, *refer to that issue.* REMOTE2 *will also be included on this month's* RAINBOW ON TAPE *and* RAINBOW ON DISK *under the filename* REMOTE2/SYS. *To copy it from tape to disk,* CLOADM *the file from tape. Then type* SAVEM"REMOTE2",&H7D00,&H7EF6,&H7D32 *and* ENTER.

| | |
|---|---|
| 2135 | 211 |
| 4050 | 183 |
| END | 132 |

**Listing 1:** NEWGAME

```
5 CLEAR2000
10 DIMA(16)
12 CLS:PRINT"THIS PROGRAM WILL S
TART A NEW   GAME OF GALACTIC CO
NFLICT":PRINT"BE SURE THE PROPER
 DISKETTE IS  INSERTED IN DRIVE
0.":PRINT
15 INPUT"HOW MANY LEVELS";LV:INP
UT"ENTER GALAXY SIZE (13-25)";SZ
:IFSZ<13 OR SZ>25 THENPRINT"TRY
AGAIN!":GOTO15
16 PRINT"HOLD ON A SEC..."
17 DIMG(SZ,SZ)
20 FORZ=1TO16:A(Z)=0:NEXT:FORZ=0
TO9:B(Z)=0:NEXT
2100 'PUT RECORD
2102 D1$="":C1$="":FOR Z=1TO16:C
1$=C1$+MKN$(A(Z)):NEXT:FORZ=0 TO
 9:D1$=D1$+MKN$(B(Z)):NEXT:AT$="
/":D1$=D1$+AT$
2105 IFL=0 THENA1$="\":B1$="\"
2106 IF R=42 THEND1$="":FORF=1TO
5:D1$=D1$+"NONAME     "+MKN$(0)+M
KN$(0):NEXTF
2110 OPEN"D",#1,"GALAXUSR/DAT",2
00
2120 FIELD#1,10 AS A$,10 AS B$,8
0 AS C$,100 AS D$
2130 LSET A$=A1$:LSET B$=B1$:LSE
T C$=C1$:LSET D$=D1$
2135 IF L=0 THENFORR=1TO42
2140 PUT#1,R
2145 IF L=0 THENNEXT
2150 CLOSE#1
3000 IF L=0 THEN L=1:R=42:A1$="N
oname":B1$="Cadet":A(1)=0:A(2)=0
:A(3)=SZ:A(4)=LV:GOTO2100
3010 CLOSE#1
4000 FOR LL=1 TO LV:PRINT"LEVEL"
;LL
4010 INPUT"# OF ROBOTOIDS";RO:IN
PUT"# OF STARTGATES";ST:INPUT"#
OF CARGO";CA:INPUT"# OF ??";Q
4020 Z=SZ*SZ:Z1=RO+Q+ST+CA:IFZ<=
Z1 THENPRINT"START OVER..":PRINT
"YOU CAN ONLY HAVE";Z;"ITEMS TOT
AL":GOTO4010
4021 PRINT"HOLD ON WHILE I CREAT
E THE LEVEL"
4022 FOR Z=1 TO Q
4024 X=RND(SZ):Y=RND(SZ):IFG(X,Y
)=0 THEN G(X,Y)=90+RND(8) ELSE40
24
4026 NEXTZ
4030 FOR Z=1TORO
4040 X=RND(SZ):Y=RND(SZ):IF G(X,
Y)=0 THEN G(X,Y)=40+RND(9) ELSE
4040
4050 NEXTZ
4060 FOR Z=1 TO ST
4070 X=RND(SZ):Y=RND(SZ):IF G(X,
Y)=0 THEN G(X,Y)=50 ELSE4070
4080 NEXTZ
4090 FOR Z=1 TO CA
4100 X=RND(SZ):Y=RND(SZ):IF G(X,
Y)=0 THEN G(X,Y)=RND(7)*1000 ELS
E 4100
4110 NEXT
4120 Z$="LEVEL"+STR$(LL)
4130 GOSUB4140:NEXTLL:GOTO4999
4140 G(1,1)=99:G(SZ,SZ)=99:G(1,S
Z)=99:G(SZ,1)=99
4150 PRINT"MAKING ";Z$
4160 OPEN"O",#1,Z$
4170 FOR X=1TOSZ:FOR Y=1 TOSZ
4180 WRITE #1,G(X,Y)
4190 NEXTY,X
4200 CLOSE#1:FOR TR=1 TO SZ:FOR
TQ=1 TO SZ:G(TR,TQ)=0:NEXT TQ,TR
:RETURN
4999 OPEN"O",#1,"RULES/TXT":PRIN
T#1,"The rules go here!":CLOSE#1
5000 PRINT"NEWGAME COMPLETE":PRI
NT"NOW ALL YOU HAVE TO DO IS:":P
RINT"LOADM REMOTE2":PRINT"EXEC":
PRINT"PCLEAR1":PRINT"RUN GALACTI
C"
```

| | | | | | |
|---|---|---|---|---|---|
| 120 | 107 | 3460 | 223 | 4530 | 221 |
| 180 | 92 | 3480 | 4 | 4725 | 164 |
| 310 | 167 | 3520 | 228 | 4804 | 28 |
| 440 | 32 | 3670 | 249 | 5005 | 144 |
| 540 | 95 | 3775 | 23 | 5065 | 27 |
| 1510 | 43 | 4050 | 248 | 5120 | 129 |
| 2100 | 140 | 4190 | 45 | 7000 | 165 |
| 3020 | 91 | 4240 | 9 | 8030 | 170 |
| 3205 | 237 | 4315 | 77 | 9000 | 63 |
| 3320 | 18 | 4340 | 206 | END | 130 |

**Listing 2:** GALACTIC

```
2 CLS(0):CLEAR2000,&H7D00:POKE&H
7D04,1
5 Z$=INKEY$:IFZ$=""THEN5
6 Z$=INKEY$:IFZ$=""THEN6
20 PRINT"Welcome to Galactic Con
flict"'PUT ANY MESSAGE HERE
40 R=42:DIMY(16),A(16):GOSUB2000
:SZ=A(3):DIMG(SZ,SZ):Y(14)=32
50 FORZ=1 TO 8:READD$(Z):NEXT:FO
RZ=0 TO 7:READ RK$(Z):NEXT:FOR Z
=0 TO 6:READTW(Z):NEXT
70 PRINTCHR$(12)
100 PRINT:B$=STRING$(23,"*"):A$=
B$:GOSUB1000:A$="* Galactic Con
flict  *":GOSUB1000:A$="*    by
Paul Alger    *":GOSUB1000:A$=B$
:GOSUB1000:PRINT:PRINT
105 PRINT:R=42:GOSUB2000:LD$=A1$
:RK$=B1$:CR=A(1):NR=A(2):SZ=A(3)
:LV=A(4):NC=A(5):WG=A(6):A$="Gal
axy size:"+STR$(SZ)+" x"+STR$(SZ
):GOSUB1000:A$="No. of levels:"+
STR$(LV):GOSUB1000:PRINT
106 IF WG=1 THENPRINT"The game h
as been won by ";TP$(1):PRINT"Do
 you want to play anyway? (Y/N):
 ";:GOSUB1500:IFZ$="N"ORZ$="n"TH
EN9999
110 IF TR<3 THENPRINT:PRINT"NEW
for new user!":PRINT"Enter Accou
nt #: ( 1 to";NR;") ";:GOSUB1500
ELSE9999
120 IF Z$="NEW" OR Z$="new" THEN
 5000
130 IF Z<1 OR Z>NR THEN PRINT:PR
INT"The Galactic Police are watc
hing!":TR=TR+1:GOTO110
140 R=Z:Y(0)=Z:GOSUB2000:ZL$=A1$
:PRINT:PRINTA1$;", enter your pa
ssword. ";:POKE&H7D03,36:GOSUB15
00:POKE&H7D03,0
150 IF Z$=B1$ THEN 160 ELSE PRIN
T:PRINT"The Galactic Police eye
you suspisiously!":GOTO110
160 NC=NC+1:POKE&H7D04,0:Y$(1)=A
1$:Y$(2)=B1$:FORZ=1TO16:Y(Z)=A(Z
):NEXT:R=41:GOSUB2000
162 LP$=Y$(1)':IFY$(1)=LEFT$(LP$
(9),LEN(Y$(1))) THENPRINT"No bac
k to back calls!":GOTO9999
165 A1$=LP$:GOSUB2100
170 Y(11)=Y(11)+1:PRINT:PRINT:A$
="Welcome back "+Y$(1)+"!!":GOSU
B1000:A$="This is turn number"+S
TR$(Y(11))+".":GOSUB1000
180 PRINT:PRINT:A$=RK$+" "+LD$+"
 is leading with"+STR$(CR)+" cre
dits.":GOSUB1000:A$="There are"+
STR$(NR)+" players playing.":GOS
UB1000:PRINT:GOSUB4000:PRINT"Top
 Five:":PRINT:GOSUB8100
190 GOSUB1100
192 PRINT:R=Y(0):GOSUB2000:GOSUB
6000
194 Z=Y(5)*(900+RND(200)):Y(6)=Y
(6)+Z:PRINT"Your base(s) made";Z
;"credits!"
```

```
195 Z=0:Z1=0:IF Y(8)>0 THEN Z=FI
X(Y(8)*.1):Y(8)=Y(8)+Z
196 IF Y(7)>0 THEN Z1=FIX(Y(7)*.
07):Y(7)=Y(7)+Z1
197 PRINT:PRINT"Interest on savi
ngs:";Z1:PRINT"Interest on loan:
  ";Z:PRINT
198 GOSUB1100:PRINT:GOSUB3000
199 X=Y(9):Y=Y(10):MV=25
280 Z1$="LEVEL"+STR$(Y(15))+"/DA
T":PRINT:PRINT"Loading galaxy":P
RINT"Start";STRING$(SZ-13," ");"
Finished":OPEN"I",#1,Z1$:FORX1=1
TOSZ:FORY1=1TOSZ:INPUT#1,G(X1,Y1
):NEXTY1:PRINT".";
281 NEXTX1:CLOSE#1:PRINT:PRINT
284 PRINT:IFY(11)=1THENPRINT"You
 start the game off in sector1,1
"ELSEPRINT"You left off last tim
e in sector";X;",";Y:G(X,Y)=G(X,
Y)-50
290 PRINT:GOTO3100
300 'COMMAND LEVEL START
310 GOSUB4000
320 IF MV<1 THEN 4802
340 PRINT:PRINT"Sector";X;",";Y;
"Level";Y(15):PRINTMV;"move(s) l
eft."
350 PRINT:PRINT"Cmd>> ";:GOSUB15
00:PRINT
360 IF LEFT$(Z$,1)="?" THEN 500
365 IF Z$="LST" OR Z$="lst" THEN
 9000
370 IF Z$="STA" OR Z$="sta" THEN
 GOSUB3000:GOTO300
380 IF Z$="SRS" OR Z$="srs" THEN
3100
390 IF Z$="TRA" OR Z$="tra" THEN
 3300
400 IF Z$="NAV" OR Z$="nav"THEN
4100
410 IF Z$="WAR" OR Z$="war" THEN
 4200
415 IF Z$="CAL" OR Z$="cal" THEN
 GOSUB8200:GOTO300
417 IF Z$="RUL"ORZ$="rul"THENGOS
UB9100:GOTO300
420 IF Z$="TLP" OR Z$="tlp" THEN
4400
430 IF Z$="GET" OR Z$="get" THEN
 4500
440 IF Z$="BUI" OR Z$="bui" THEN
 4600
450 IF Z$="END" OR Z$="end" THEN
 4800
460 IF Z$="LRS" OR Z$="lrs" THEN
 4700
470 IF Z$="LVL" OR Z$="lvl" THEN
 7000
480 IF Z$="TOP" OR Z$="top"THEN
GOSUB8100:GOTO300
490 PRINT:PRINT"No comprendo!":G
OTO300
500 'COMMAND LIST
510 PRINT:PRINT:A$="Available Co
mmands":GOSUB1000:PRINT:A$="Comm
and           Description":GOSUB
1000:A$=STRING$(29,"-"):GOSUB100
0:A$="NAV          Navigation comm
and":GOSUB1000
520 A$="STA            Your current
Status":GOSUB1000:A$="TRA
 Trade at Outpost   ":GOSUB1000:
A$="WAR         Declare War on us
er":GOSUB1000:A$="LRS           Lon
g range scan    ":GOSUB1000:A$="
SRS        Short range scan    ":
GOSUB1000
530 A$="BUI            Build your ba
se   ":GOSUB1000:A$="TLP
Teleport your fleet":GOSUB1000:A
$="GET           Get cargo
 ":GOSUB1000
540 A$="LVL            Change levels
     ":GOSUB1000:A$="LST
List players           ":GOSUB1000
545 A$="CAL            Last nine cal
lers ":GOSUB1000:A$="RUL
Display rules          ":GOSUB1000
550 A$="TOP            List top 5 pl
ayers":GOSUB1000:A$="END
End your turn          ":GOSUB1000:GO
TO300
1000 'Print centered
1020 IF LEN(A$)<Y(14) THEN PRINT
TAB((Y(14)-LEN(A$))/2);A$ ELSE P
RINTA$
1099 RETURN
1100 'Print Continue Prompt with
 MCI trick
1102 A$="Hit /RETURN/ to continu
e: "
1110 PRINTA$;
1120 Z$=INKEY$
1130 IF Z$=CHR$(13) THEN 1150 EL
SE 1120
1150 FOR Z=1 TO LEN(A$)
1160 PRINTCHR$(8);
1170 NEXTZ:PRINT"Thank you!"
1180 RETURN
1500 'INPUT ROUTINE
```

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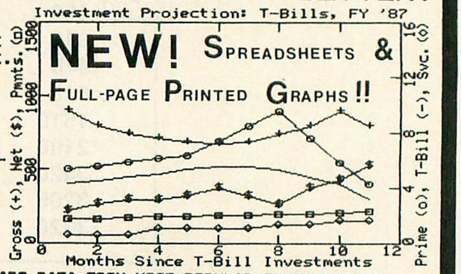

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```
1510 LINEINPUTZ$:Z=VAL(Z$):RETUR
N
2000 'GET RECORD
2010 OPEN"D",#1,"GALAXUSR/DAT",2
00
2020 FIELD #1,10 AS A$,10 AS B$,
80 AS C$,100 AS D$
2035 GET#1,R:A1$=A$:B1$=B$:C1$=C
$:D1$=D$:CLOSE#1
2050 Z1=1:FOR Z=1TO80 STEP 5:Z$=
MID$(C1$,Z,5):A(Z1)=CVN(Z$):Z1=Z
1+1:NEXT
2055 IFR<41 THENZ1=0:FOR Z=1 TO5
0 STEP5:Z$=MID$(D1$,Z,5):B(Z1)=C
VN(Z$):Z1=Z1+1:NEXT:AT$=RIGHT$(D
1$,50)
2056 IF R=41 THEN Z1=0:FORZ=1TO1
00 STEP 10:LP$(Z1)=MID$(D1$,Z,10
):Z1=Z1+1:NEXT
2057 IF R=42 THEN Z1=1:FOR Z=1 T
O 100 STEP 20:TP$(Z1)=MID$(D1$,Z
,10):TP(Z1)=CVN(MID$(D1$,Z+10,5)
):TU(Z1)=CVN(MID$(D1$,Z+15,5)):Z
1=Z1+1:NEXT
2058 FOR Z=1 TO LEN(B1$):IF RIGH
T$(B1$,1)=" " THEN B1$=LEFT$(B1$
,LEN(B1$)-1):GOTO2058
2059 IF RIGHT$(A1$,1)=" " THEN A
1$=LEFT$(A1$,LEN(A1$)-1):GOTO205
9
2060 RETURN
2100 'PUT RECORD
2102 D1$="":C1$="":FOR Z=1TO16:C
1$=C1$+MKN$(A(Z)):NEXT:IFR<41 TH
ENFORZ=0 TO 9:D1$=D1$+MKN$(B(Z))
:NEXT:D1$=D1$+AT$
2103 IF R=41 THEN FORZ=1 TO 9:LP
$(Z-1)=LP$(Z):D1$=D1$+LP$(Z):NEX
T:D1$=D1$+LP$
2104 IF R=42 THEN FORZ=1TO5:D1$=
D1$+TP$(Z)+MKN$(TP(Z))+MKN$(TU(Z
)):NEXT
2110 OPEN"D",#1,"GALAXUSR/DAT",2
00
2120 FIELD#1,10 AS A$,10 AS B$,8
0 AS C$,100 AS D$
2130 LSET A$=A1$:LSET B$=B1$:LSE
T C$=C1$:LSET D$=D1$
2140 PUT#1,R
2150 CLOSE#1:RETURN
3000 'STATUS REPORT
3010 PRINT:PRINT"You currently h
ave:":PRINT:FORZ=1 TO 8:PRINTUSI
NG"##,###,###";Y(Z);:PRINT"  ";D
$(Z):NEXT
3020 PRINTUSING"##,###,###";Y(13
);:PRINT"  Power scanner":TW=(Y(
1)*100000)+(Y(2)*5000)+(Y(3)*250
0)+(Y(4)*2500)+(Y(5)*10000)+Y(6)
+Y(7)-Y(8)+(Y(13)*20000):PRINT"-
--------------------------":PRIN
TUSING"##,###,###";TW;:PRINT"  T
otal worth"
3030 PRINT:PRINT:GOSUB1100:RETUR
N
3100 'SHORT RANGE SCAN
3110 PRINT"Sensors indicate:":WR
=0:CG=0:NU=0:YB=0
3115 IF X<1 OR X>SZ OR Y<1 OR Y>
SZ THEN PRINT"Nothing! (You left
 the Universe)":GOTO300
3120 IF G(X,Y)=99 THEN PRINT"A T
rading Outpost.":GOTO300
3130 IF G(X,Y)=50 THEN PRINT"A S
targate!!":GOTO300
3150 IF G(X,Y)>40 AND G(X,Y)<50
THEN Z=G(X,Y)-40:PRINT"A class";
Z;"Robodroid!!":WR=3:GOTO4200
3160 IF G(X,Y)=0 THEN PRINT"A ne
utral planet with no cargo.":NU=
1:GOTO300
3170 IF G(X,Y)>90 AND G(X,Y)<99
THEN 8000
3180 Z$=STR$(G(X,Y)):Z1$=RIGHT$(
Z$,2):UN=VAL(Z1$)
3190 IF LEN(Z$)>4 THEN Z2$=LEFT$
(Z$,2):C=VAL(Z2$):Z3$=MID$(Z$,3,
1):B=VAL(Z3$) ELSE Z2$="":C=0:Z3
$=LEFT$(Z$,2):B=VAL(Z3$)
3200 IF UN=0 THEN PRINT"A neutra
l planet with";C;"cargo bays!":C
G=C:NU=1:GOTO300
3205 IFC>0 THEN PRINTC;"cargo ba
y(s) and ";
3210 IF UN=Y(0) THEN PRINT"Your
planet with";B;"base(s).":CG=C:Y
B=1:GOTO300
3220 IF UN>50 THEN WR=2:PRINT"An
 enemy fleet!!":UN=UN-50:IF UN>0
 AND UN<=NR THEN R=UN:GOSUB2000:
PRINT"The fleet belongs to:":PRI
NT"-=< ";RK$(A(12));" ";A1$;" >=
-":PRINT"There are";A(2);"fighte
rs deployed!":GOTO300
3230 IF UN>0 AND UN<41 THEN WR=1
:PRINT"An enemy planet with";B;"
 base(s)!":IF UN>0 AND UN<=NR THE
N R=UN:GOSUB2000:PRINT"This plan
et belongs to:":PRINT"-=< ";RK$(
A(12));" ";A1$;" >=-":GOTO300
3240 WR=0:PRINT"This object is n
ot recognized!":PRINT"I'm going
to neutralize this sector!":G(X,
Y)=0:GOTO300
3300 'TRADING BASE
3310 IF G(X,Y)<>99 THEN PRINT"Th
ere is no Trading Outpost here!"
:GOTO300
3320 PRINT:PRINT"Welcome to our
Outpost.":PRINT:PRINT"[B] Buy go
ods":PRINT"[S] Sell goods":PRINT
"[C] Credit Union":PRINT"[Q] Qui
t"
3330 PRINT:PRINT"Outpost>> ";:GO
SUB1500
3340 IF Z$="B" OR Z$="b" THEN 34
00
3350 IF Z$="S" OR Z$="s" THEN350
0
3360 IF Z$="C" OR Z$="c" THEN360
0
3370 IF Z$="Q" OR Z$="q" THEN 30
0
3380 IF Z$="?" THEN 3320
3385 PRINT"No comprendo!":GOTO33
30
3400 'BUY
3405 P1=100000+RND(25000):P2=180
00+RND(3000):P3=4000+RND(2000):P
4=2000+RND(1000):P5=100+RND(100)
3410 PRINT:PRINT"Items available
":PRINT:PRINT"No.  Description
   Price":PRINTSTRING$(27,"-"):
PRINT" 1.   Flagship       ";P1:P
RINT" 2.   Scanner        ";P2
3420 PRINT" 3.   Fighter
 ";P3:PRINT" 4.   Base kit
 ";P4:PRINT" 5.   Quit
   ";P5
3430 PRINT:PRINT"You have";Y(6);
"credits.  Your choice (1-5) or
?: ":PRINT"Buy>> ";:GOSUB1500
3440 IF Z$="?" THEN 3410
3450 IF Z<1 OR Z>5 THEN 3430
3460 ON Z GOTO 3470,3475,3480,34
85,3490
3470 Z=FIX(Y(6)/P1):IF Z=0 THENP
RINT"You can't afford a Flagship
!":GOTO3430 ELSE PRINT"You can b
uy";Z;"Flagship(s)."
3472 PRINT"How many do you want?
 ";:GOSUB1500:Z1=VAL(Z$):IF Z1>0
 AND Z1<=Z THEN PRINT"Done..":Y(
6)=Y(6)-(P1*Z1):Y(1)=Y(1)+Z1:GOT
O3430 ELSE PRINT "No sale!!":GOT
O3430
3475 Z=FIX(Y(6)/P2):IF Z=0 THENP
RINT"You can't afford a Scanner!
":GOTO3430 ELSE PRINT"You can bu
y";Z;"Scanner(s)."
3477 PRINT"How many do you want?
 ";:GOSUB1500:Z1=VAL(Z$):IF Z1>0
 AND Z1<=Z THEN PRINT"Done..":Y(
13)=Y(13)+Z1:Y(6)=Y(6)-(P2*Z1):G
OTO3430 ELSEPRINT"No sale!!":GOT
O3430
3480 Z=FIX(Y(6)/P3):IF Z=0 THENP
RINT"You can't afford a Fighter!
":GOTO3430 ELSEPRINT"You can buy
";Z;"Fighter(s)."
3482 PRINT"How many do you want?
 ";:GOSUB1500:Z1=VAL(Z$):IF Z1>0
 AND Z1<=Z THENPRINT"Done..":Y(6
)=Y(6)-(P3*Z1):Y(2)=Y(2)+Z1:GOTO
3430 ELSEPRINT"No sale!!":GOTO34
30
3485 Z=FIX(Y(6)/P4):IF Z=0 THENP
RINT"You can't afford a Base kit
!":GOTO3430 ELSEPRINT"You can bu
y";Z;"Base kit(s).":
3487 PRINT"How many do you want?
 ";:GOSUB1500:Z1=VAL(Z$):IF Z1>0
 AND Z1<=Z THENPRINT"Done..":Y(6
)=Y(6)-(P4*Z1):Y(4)=Y(4)+Z1:GOTO
3430 ELSEPRINT"No sale!!":GOTO34
30
3490 Y(6)=Y(6)-P5:GOTO3300
3500 'SELL
3505 PRINT:PRINT
3507 IF Y(3)<1 AND Y(1)<2 THEN P
RINT"You have nothing I want!":G
OTO3300
3510 IF Y(3)>0 THEN PRINT"I see
you have";Y(3);"Cargo bays.":P1=
Y(3)*(2000+RND(1000)):PRINT"I'll
 give you";P1;"for it.":PRINT"Wa
nt to sell? (Y/N): ";:GOSUB1500:
IF Z$="Y" OR Z$="y" THENPRINT"Do
ne..":Y(6)=Y(6)+P1:Y(3)=0 ELSEPR
INT"No cargo sold."
3520 IF Y(1)>1 THEN PRINT"I see
you have";Y(1)-1;"Flagships.":P1
=90000+RND(1000):PRINT"I'll give
 you";P1;"for one.":PRINT"Want t
o sell? (Y/N) ";:GOSUB1500:IF Z$
="Y" OR Z$="y" THENPRINT"Done.."
:Y(1)=Y(1)-1:Y(6)=Y(6)+P1 ELSEPR
INT"No Flagships sold."
3530 PRINT:PRINT"I see nothing e
lse that I want.":GOTO3300
3600 'BANK
3610 PRINT:A$="Welcome to Galact
ic Federal.":GOSUB1000:PRINT
3620 A$="[D] Deposit   ":GOSUB10
00:A$="[W] Withdraw  ":GOSUB1000
:A$="[S] Statement ":GOSUB1000:A
$="[L] Loan      ":GOSUB1000:A$=
"[Q] Quit bank ":GOSUB1000:PRINT
3630 PRINT:PRINT"Bank":PRINT"You
r choice or ?: ";:GOSUB1500:PRIN
T
3640 IF Z$="?" THEN 3610
3650 IF Z$="D" OR Z$="d" THEN375
0
3660 IF Z$="W" OR Z$="w" THEN380
0
3670 IF Z$="S" OR Z$="s" THEN PR
INT"Credits on hand: ";Y(6):PRIN
T"Credits on loan: ";Y(8):PRINT"
Credits in Bank: ";Y(7):PRINT:GO
TO3630
3680 IF Z$="Q" OR Z$="q" THEN 33
00
3690 IF Z$="L" OR Z$="l" THEN 37
10
3700 GOTO3630
```

```
3710 IF TW<500000 THEN PRINT"The
 loan officer throws you out!!":
GOTO3630
3720 PRINT"I see you are worth";
TW:PRINT"I'll loan you up to";:Z
=FIX(TW/2):PRINTZ:PRINT"The term
s are 10% per turn.":PRINT
3730 PRINT"Enter amount. Max is"
;Z;:GOSUB1500:Z1=VAL(Z$)
3740 IF Z1<0 OR Z1>Z THEN 3730 E
LSE Y(6)=Y(6)+Z1:Y(8)=Y(8)+Z1:GO
TO3630
3750 'SAVINGS
3752 IF Y(6)<0 THEN Y(6)=0
3755 IF Y(8)>0 THENPRINT"You hav
e an outstanding loan.":PRINT"An
y deposits made will go against
it."
3760 PRINT:PRINT"Enter amount of
 deposit.":PRINT"Max is";Y(6);":
 ";:GOSUB1500:Z=VAL(Z$):IF Z<0 O
R Z>Y(6) THEN3760
3770 IF Y(8)>0 THEN Y(8)=Y(8)-Z:
Y(6)=Y(6)-Z:IF Y(8)=<0 THEN Y(7)
=Y(7)+ABS(Y(8)):Y(8)=0:PRINT"You
 have paid off your loan!":GOTO3
780
3775 IF Y(8)=0 THENY(7)=Y(7)+Z:Y
(6)=Y(6)-Z
3780 PRINT"Done..":GOTO3630
3800 'WITHDRAW
3810 PRINT:PRINT"Enter amount of
 withdrawal.":PRINT"Max is";Y(7)
;": ";:GOSUB1500:Z=VAL(Z$):IF Z<
0 OR Z>Y(7) THEN3810 ELSE Y(6)=Y
(6)+Z:Y(7)=Y(7)-Z:PRINT"Done..":
GOTO3630
4000 'TW CALC
4010 TW=(Y(1)*100000)+(Y(2)*5000
)+(Y(3)*2500)+(Y(4)*2500)+(Y(5)*
10000)+Y(6)+Y(7)-Y(8)+(Y(13)*200
00)
4020 IF TW>TW(Y(12)) AND Y(12)<7
 THEN Y(12)=Y(12)+1:PRINT:PRINT"
Congratulations!":PRINT"You have
 been promoted to ";RK$(Y(12)):I
FY(12)=7 THENPRINT"You just won
the game!!":WG=1
4030 IF Y(12)>0 THEN IF TW<TW(Y(
12)-1) THEN Y(12)=Y(12)-1:PRINT:
PRINT"Sorry..":PRINT"You have be
en demoted to ";RK$(Y(12))
4050 TP$=Y$(1):TU(6)=0:TP$(6)="N
ONAME     ":TP(6)=0:L=0:FORZ=1TO5
:IFTU(Z)=Y(0)THEN L=Z:Z=6
4051 NEXT
4052 IF LEN(TP$)<10 THEN TP$=TP$
+" ":GOTO4052
4055 IFL=0THEN4065
4060 FOR Z=L TO 5:TP$(Z)=TP$(Z+1
):TP(Z)=TP(Z+1):TU(Z)=TU(Z+1):NE
XT
4065 L=0:FORZ=1TO5:IFTW>TP(Z)THE
NL=Z:Z=6
4070 NEXT:IF L>0 THEN 4075 ELSER
ETURN
4075 FORZ=5 TO L+1 STEP-1:TP$(Z)
=TP$(Z-1):TP(Z)=TP(Z-1):TU(Z)=TU
(Z-1)
4080 NEXT:TP$(L)=TP$:TP(L)=TW:TU
(L)=Y(0):RETURN
4100 'NAV
4110 PRINT:PRINT"Enter course. (
1-8): ";:GOSUB1500:Z2=FIX(VAL(Z$
)):IF Z2<1 OR Z2>8 THENPRINT"Nav
 aborted!":GOTO300
4120 PRINT:PRINT"Enter warp fact
or. (1-8): ";:GOSUB1500:Z1=FIX(V
AL(Z$)):IF Z1<1 OR Z1>8 THENPRIN
T"Nav aborted!":GOTO300
4130 IF Z2=1 THEN Y=Y-Z1
4140 IF Z2=2 THEN Y=Y-Z1:X=X+Z1
4150 IF Z2=3 THEN X=X+Z1
4160 IF Z2=4 THEN X=X+Z1:Y=Y+Z1
4165 IF Z2=5 THEN Y=Y+Z1
4170 IF Z2=6 THEN X=X-Z1:Y=Y+Z1
4180 IF Z2=7 THENX=X-Z1
4190 IF Z2=8 THENX=X-Z1:Y=Y-Z1
4199 MV=MV-1:GOTO290
4200 'WAR
4210 IF WR=0 THENPRINT"There is
nobody here to attack!":GOTO300
4212 :IFWR=2 AND B(9)<>0 THENPRI
NT"That player has been attacked
!":GOTO300
4215 FORZ=0 TO 8:IF B(Z)<1THENAK
=Z:Z=10:NEXTELSE AK=8:NEXT
4216 O$="0":PN$=STR$(Y(0)):IF LE
N(PN$)>2 THEN PN$=RIGHT$(PN$,2)
ELSE PN$="0"+RIGHT$(PN$,1)
4217 X$=STR$(X):IF LEN(X$)>2 THE
N X$=RIGHT$(X$,2)ELSEX$="0"+RIGH
T$(X$,1)
4218 LE$=STR$(Y(15)):LE$=RIGHT$(
LE$,1):Y$=STR$(Y):IF LEN(Y$)>2 T
HEN Y$=RIGHT$(Y$,2)ELSEY$="0"+RI
GHT$(Y$,1)
4220 IF WR=1 THENPRINTA1$;"'s pl
anet has";B;"base(s).":ST=B*3
4230 IF WR=2 THENPRINTA1$;"'s fl
eet has";A(2);"fighters deployed
!":ST=A(2)
4240 IF WR=3THENST=(G(X,Y)-40)*Y
(15):PRINT"The Robodroid is atta
cking!":Z=RND(3):IFZ=3 THENPRINT
"The Robodroid surprized you!":Z
1=FIX((RND(10)*.01)*Y(2)):IF Z1>
0 THENPRINT"He captured";Z1;"of
your fighter(s)!":Y(2)=Y(2)-Z1:S
T=ST+Z1
4245 IF WR=3THENPRINT"He has";ST
;"fighters deployed!"
4250 PRINT:PRINT"How many fighte
rs will you deploy?":PRINT"Max i
s";Y(2);": ";:GOSUB1500:Z=VAL(Z$
):IF Z<0 OR Z>Y(2) THEN 4250
4260 IF WR<>3 AND Z=0 THENPRINT"
Attack Aborted!":GOTO300
4270 PRINT:YS=Z:FORQ=1TO3:PRINT"
CONDITION RED!!";:FORQ1=1 TO 15:
PRINTCHR$(8);:NEXTQ1,Q:PRINT"CON
DITION RED!!"
4280 PRINT"You           Enemy":PRI
NTSTRING$(15," ");
4290 PRINTSTRING$(15,8);:Z1$=STR
$(YS):Z2$=STR$(ST):Z1=LEN(Z1$)+L
EN(Z2$):Z3$=STRING$(15-Z1," "):Z
4$=Z1$+Z3$+Z2$:PRINTZ4$;
4295 IFYS<1 OR ST<1 THEN 4310
4300 Z1=RND(100):IF Z1>60 THEN Y
S=YS-1 ELSEST=ST-1
4305 GOTO4290
4310 PRINT:PRINT:PRINT:IF YS>0 T
HENST=0:PRINT"You won!!" ELSE IF
 ST>0 THENYS=0: PRINT"You lost!!
":ELSEPRINT"It was a draw."YS=0:
ST=0
4315 PRINT"You lost";Z-YS;"fight
ers.":Y(2)=Y(2)-(Z-YS):IF YS<1 A
ND Y(2)>0 THENPRINT"Do you want
to deploy more fighters? (Y/N):
";:GOSUB1500:IF Z$="Y" OR Z$="y"
 THEN4250
4320 IF WR=1 AND ST<1 THEN A(5)=
A(5)-B:G(X,Y)=G(X,Y)-UN+Y(0):Y(5
)=Y(5)+B:PRINT"You have conquere
d this planet!":CD$="1":B(AK)=VA
L(CD$+LE$+X$+Y$+PN$):GOSUB2100:G
OTO290
4325 IF WR=1 THENPRINTA1$;"'s pl
anet survived your attack!":CD$=
"2":B(AK)=VAL(CD$+LE$+X$+Y$+PN$)
:GOSUB2100:GOTO300
4330 IF WR=2 AND ST<1 THENPRINT"
You beat ";A1$;"'s fleet!":PRINT
"You get:":PRINTA(6);"credits.":
Y(6)=Y(6)+A(6):A(6)=0:PRINTA(3);
"cargo bays.":Y(3)=Y(3)+A(3):A(3
)=0:Z1=FIX(A(2)/4):PRINTZ1;"figh
ters.":Y(2)=Y(2)+Z1:A(2)=1:GOSUB
4360:GOSUB2100:GOTO300
4335 IF WR=2 THENPRINTA1$;"'s fl
eet won!":PRINT"Troups board you
r Flagship and":PRINT"take all c
argo and credits!":A(2)=A(2)+FIX
(Z/4):A(3)=A(3)+Y(3):Y(3)=0:A(6)
=A(6)+Y(6):Y(6)=0:CD$="3":B(AK)=
VAL(CD$+LE$+X$+Y$+PN$):GOSUB2100
:GOTO300
4340 IF WR=3 AND ST<1 THENPRINT"
You beat the Robodroid!":Z1=(G(X
,Y)-40+Y(15))*(5000+RND(2000)):P
RINT"He had";Z1;"credits!":Y(6)=
Y(6)+Z1:G(X,Y)=0:GOTO290
4350 IF WR=3 THENPRINT"The Robod
roid takes all your money!":PRIN
T"He tows your fleet away...":Y(
6)=0:X=RND(SZ-2)+1:Y=RND(SZ-2)+1
:GOTO290
4360 'GET WINNERS COMMENT
4370 B(9)=Y(0):PRINT:PRINT"Enter
 comment to ";A1$;" (50 chrs max
)":AT$="Gotcha!!!":PRINT"<CR>=";
AT$:GOSUB1500:IF LEN(Z$)>1 THENA
T$=Z$
4380 RETURN
4400 'TLP
4410 IF G(X,Y)<>50 THEN PRINT"Th
ere is no Stargate here!":GOTO30
0
4420 PRINT"Enter X coordinate: "
;:GOSUB1500:X=VAL(Z$):PRINT"Ente
r Y coordinate: ";:GOSUB1500:Y=V
AL(Z$):GOTO290
4500 'GET
4510 IF CG=0THENPRINT"No cargo h
ere!":GOTO300
4520 Z=Y(1)*10:IF Y(3)+CG>Z THEN
PRINT"It all won't fit!":C1=Z-Y(
3):CG=CG-C1:Y(3)=Z:G(X,Y)=G(X,Y)
-(C1*1000):GOTO290
4530 Y(3)=Y(3)+CG:G(X,Y)=G(X,Y)-
(CG*1000):GOTO290
4599 'BUI
4600 IF NU=0 THENPRINT"You can't
 build a base here!":GOTO290
4605 IF Y(4)>Y(15) THENZ1=Y(15)E
LSEZ1=Y(4)
4610 PRINT"Build how many bases?
":PRINT"Max is";Z1;":";:GOSUB150
0:Z=VAL(Z$):IF Z<0 OR Z>Z1 THEN4
610
4620 IF Z=0THEN300
4630 G(X,Y)=G(X,Y)+(Z*100)+Y(0):
Y(4)=Y(4)-Z:Y(5)=Y(5)+Z:GOTO290
4700 'LRS
4705 IF Y(13)<1 THENPRINT"You do
n't have a scanner!":GOTO300
4710 PRINT"Scan how far? Max is"
;Y(13);:GOSUB1500:Z=VAL(Z$):IF Z
<0 OR Z>Y(13) THEN4710
4715 Y3=Y-Z:Y4=Y+Z:X3=X-Z:X4=X+Z
4720 FOR Y2=Y3 TO Y4:FOR X2=X3 T
O X4
4725 IF X2=X AND Y2=Y THENPR$="^
":GOTO4780
4730 IF X2>0 AND X2<21 AND Y2>0
AND Y2<21 THENLC$=STR$(G(X2,Y2))
ELSEPR$="*":GOTO4780
4735 Z=VAL(RIGHT$(LC$,2)):IF Z=0
 AND G(X2,Y2)>0 THEN PR$=STR$(FI
X(G(X2,Y2)/1000)):PR$=RIGHT$(PR$
,1):GOTO4780
4740 IF Z=50 THENPR$="S":GOTO478
0
4745 IF Z>40 AND Z<50 THENPR$="R
```

# Telewriter-64™

## the Color Computer Word Processor

- **3 display formats: 51/64/85 columns × 24 lines**
- **True lower case characters**
- **User-friendly full-screen editor**
- **Right justification**
- **Easy hyphenation**
- **Drives any printer**
- **Embedded format and control codes**
- **Runs in 16K, 32K, or 64K**
- **Menu-driven disk and cassette I/O**
- **No hardware modifications required**

### THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

> *...one of the best programs for the Color Computer I have seen...*
> — Color Computer News, Jan. 1982

### TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

### 64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

### 64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64 × 24 and 85 × 24!! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

### RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

### FEATURES & SPECIFICATIONS:

**Printing and formatting:** Drives any printer (LPVII/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminet, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dot-graphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

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**File and I/O Features:** ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette auto-retry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

**Editing features:** Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

> *...truly a state of the art word processor... outstanding in every respect.*
> — The RAINBOW, Jan. 1982

### PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs $49.95 on cassette, $59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The step-by-step tutorial will have your writing with Telewriter-64 in a matter of minutes.)

To order, send check or money order to:

Cognitec
704 Nob Street
Del Mar, CA 92014

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited. (Add $2 for shipping. Californians add 6% state tax.)

**Available at**
**Radio Shack stores**
**via express order**
**catalogue #90-0253**
**90-0254**

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# Computer Island Educational Software

### ARROW GAMES

32K Ext. - $21.95 tape/$26.95 disk

Six menu driven games for young children (ages 3-6) to teach directions. All games involve using the arrow keys ONLY. Games include: LADYBUG, BUTTERFLY, ARROW MATCH, KALEIDOSCOPE, RABBIT, and DOODLE. Colorful graphics.

### FIRST GAMES

32K Ext. - $24.95 tape/$29.95 disk

First Games contains 6 menu driven programs to delight and teach your early learners (ages 3-6). These games enrich the learning of colors, numbers, lower case letters, shapes, memory, visual discrimination and counting.

### CLOZE STORIES

32K Ext. - $19.95 Tape/$24.95 Disk

These programs give students practice using the popular CLOZE reading technique. Each program contains grade appropriate short stories with key missing words to be deduced by the student. Available for grades 3, 4, 5, 6, OR 7. Please specify.

### DRAWING CONCLUSIONS

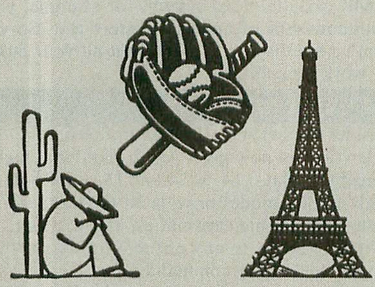
32K Ext. - tape $19.95/disk $24.95

These programs contain short stories. Each story has two accompanying questions that ask the student to draw conclusions from the text. Available for grades 3-4 OR 5-6. Please specify.

### LOCATING STORY DETAILS

32K Ext. - disk only - $24.95

These programs contain short stories. Each has an accompanying picture. Questions about story details refer to either the text or pictures. The disk generated graphics are an integral part of these attractive programs. Available for grades 2-3 OR 4-5. Please specify.



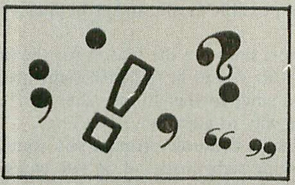
### FOREIGN LANGUAGE GAMES

32K Ext. - $19.95 tape/$24.95 disk

(500 words)

**French or Spanish Baseball**

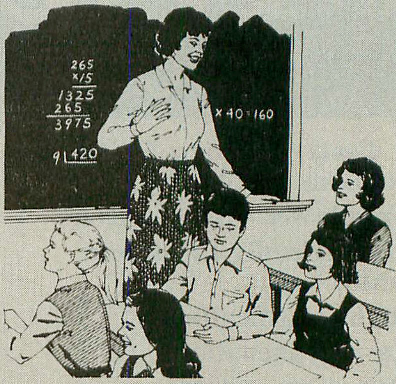
Score base hits or home runs for correct answers. You're out if wrong. Correct answers supplied. Fun way to learn and practice vocabulary. PLEASE SPECIFY LANGUAGE.



### PUNCTUATION PRACTICE

32K Ext. - tape $19.95/disk $24.95

On screen practice in proper usage of the familiar punctuation marks. Grades 3-7.



### MATH TUTOR SERIES

16K Ext.

These tutorials take the child through each step of the example. All programs include HELP tables, cursor and graphic aids. All allow user to create the example, or let the computer choose. Multi-level. Great teaching programs.

**LONG DIVISION TUTOR**
$14.95 tape/$19.95 disk
**MULTIPLICATION TUTOR**
$14.95 tape/$19.95 disk
**FACTORS TUTOR**
$19.95 tape/$24.95 disk
**FRACTIONS TUTOR (addition)**
$19.95 tape/$24.95 disk
**FRACTIONS TUTOR (subtraction)**
$19.95 tape/$24.95 disk
**FRACTIONS TUTOR (mult.)**
$19.95 tape/$24.95 disk

### COMPUTER LITERACY

32K Ext. - $19.95 tape/$29.95 disk

A computer literacy quiz exclusively for the Color Computer. Tests and scores from over 60 questions on a Hi-res upper and lower case screen. Reviews computer literacy and beginning programming knowledge. Ages 10 and up.

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TRS-80 Color Computer

**All Payments in U.S. Funds.**

```
":GOTO4780
4750 IF Z>90 AND Z<99 THEN PR$="
?":GOTO4780
4755 IF Z=99 THEN PR$="T":GOTO47
80
4760 IF Z=Y(0) THEN PR$="$":GOTO
4780
4765 IF Z>50 THEN PR$="#":GOTO47
80
4770 IF Z>0 AND Z<41 THENPR$="E"
:GOTO4780
4775 IF Z=0 THEN PR$="0"
4780 PRINTPR$;:NEXTX2:PRINTCHR$(
13);:NEXTY2:GOTO300
4800 'END
4801 PRINT"End your turn? (Y/N)
";:GOSUB1500:IF Z$="Y" OR Z$="y"
 THEN4802 ELSE 300
4802 IF YB=1 OR NU=1 THEN4804 EL
SEPRINT"You can't stay here!":X=
RND(SZ-2)+1:Y=RND(SZ-2)+1:PRINT"
Your fleet was taken to";X;Y:MV=
0:GOTO3100
4804 IF NU=1 THENPRINT"I'm charg
ing you double to build this bas
e for you!":G(X,Y)=150+Y(0):Y(5)
=Y(5)+1:Y(8)=Y(8)+5000
4806 IF YB=1 THEN G(X,Y)=G(X,Y)+
50
4810 GOSUB3000
4820 LD$=TP$(1):CR=TP(1):IFTU(1)
=Y(0)THENPRINT"You are leading!!
":RK$=RK$(Y(12))
4825 R=42:GOSUB2100
4830 R=Y(0):GOSUB2000:FORZ=1TO16
:A(Z)=Y(Z):NEXTZ:FORZ=0TO9:B(Z)=
0:NEXTZ:AT$="/":A(9)=X:A(10)=Y:G
OSUB2100
4900 Z1$="LEVEL"+STR$(Y(15))+"/D
AT":PRINT:PRINT"Saving galaxy":P
RINT"Start";STRING$(SZ-13," ");"
Finished":OPEN"O",#1,Z1$:FORX1=1
TOSZ:FORY1=1TOSZ:WRITE#1,G(X1,Y1
):NEXTY1:PRINT".";
4910 NEXTX1:CLOSE#1
4930 GOTO9999
5000 'NEW USER
5005 IF NR>39 THEN PRINT"Sorry..
 game is closed to new users.":R
UN"BBS
5010 PRINT:PRINT:PRINT"Welcome t
o Galactic Conflict.":PRINT"Sinc
e you have not played before,":P
RINT"I need some information abo
ut you."
5020 POKE&H7D04,1:PRINT:PRINT:PR
INT"What name will you be using?
":PRINT"(10 characters max.) ";:
GOSUB1500:IF LEN(Z$)>10 THEN Z$=
LEFT$(Z$,10)ELSEIF LEN(Z$)=0 THE
N5020
5025 GOSUB5100:Y$(1)=Z$
5030 PRINT"Fine ";Y$(1);".":PRIN
T:PRINT"Enter a password. (10 ch
ar. max) ";:GOSUB1500:IF LEN(Z$)
>10 THEN Z$=LEFT$(Z$,10):Y$(2)=Z
$ ELSE Y$(2)=Z$
5040 PRINT"Thank you.":PRINT:PRI
NT"How wide is your terminal scr
een? ";:GOSUB1500:Z=VAL(Z$):IF Z
<20 THEN Z=20 ELSE IF Z>80 THEN
Z=80
5050 Y(14)=Z:PRINT:PRINT:A$="I h
ave it as:":GOSUB1000:A$="Name:
"+Y$(1):GOSUB1000:A$="Password:
"+Y$(2):GOSUB1000:A$="Terminal w
idth: "+STR$(Y(14)):GOSUB1000:PR
INT:PRINT
5060 PRINT"Is this correct? (Y/N
) ";:GOSUB1500:IF Z$="Y" OR Z$="
y" THEN 5065 ELSE 5020
5065 PRINT:PRINT"Hold on while I
 create your account.":R=42:GOSU
B2000:A(2)=A(2)+1:AN=A(2):GOSUB2
100
5070 R=AN:Y(15)=1:Y(1)=1:Y(2)=10
:Y(4)=3:Y(6)=10000:Y(8)=167500:Y
(9)=1:Y(10)=1:A1$=Y$(1):B1$=Y$(2
)
5080 FORZ=1TO16:A(Z)=Y(Z):NEXT:F
ORZ=0TO9:B(Z)=0:NEXT:GOSUB2100
5090 PRINT:PRINT:A$="Your accoun
t # is"+STR$(AN)+".":GOSUB1000:A
$="Your password is "+Y$(2)+".":
GOSUB1000:PRINT:A$="Write these
down!":GOSUB1000:A$="You'll need
 them later.":GOSUB1000:PRINT:GO
SUB1100
5095 PRINT:PRINT"I'll spot you e
nough credits to ge started":PRI
NT"but you'll have to pay me bac
k.":PRINT"I charge 10% interest.
":PRINT
5099 PRINT:PRINT"Now you must lo
g in using your":PRINT"account #
 and password.":GOTO70
5100 'Upper-lower case convertio
n
5120 Z3$=LEFT$(Z$,1):FOR Z=2 TO
LEN(Z$):Z1$=MID$(Z$,Z,1)
5130 IF ASC(Z1$)<48 THEN Z3$=Z3$
+Z1$:Z5=1:GOTO5160
5140 IF Z5=0 AND ASC(Z1$)>64 AND
 ASC(Z$)<91 THEN Z2=ASC(Z1$)+32:
Z2$=CHR$(Z2) ELSE Z5=0:Z2$=Z1$
5150 Z3$=Z3$+Z2$
5160 NEXT
5170 Z$=Z3$:RETURN
6000 'ATTAC REPORT
6010 FORZ=0TO8:IFB(Z)=0THEN6040
6020 AT$=STR$(B(Z)):CD$=LEFT$(AT
$,2):X$=MID$(AT$,4,2):Y$=MID$(AT
$,6,2):PN$=RIGHT$(AT$,2):LE$=MID
$(AT$,3,1)
6025 IFCD$=" 1" THENPRINT"Player
 #";PN$;" took over your base at
 ";X$;",";Y$;" Level ";LE$:PRINT
6028 IF CD$=" 2" THENPRINT"Playe
r #";PN$;" attacked your base at
 ";X$;",";Y$;" Level ";LE$:PRINT
" but failed to take it over!":P
RINT
6030 IF CD$=" 3" THENPRINT"Playe
r #";PN$;" attacked your fleet b
ut lost!":PRINT
6040 B(Z)=0:NEXT
6050 AT$=RIGHT$(D1$,50):IF B(9)=
0 THEN RETURN
6060 PRINT"Player #";B(9);"overr
an your fleet.":PRINT"That playe
r left you this comment:":PRINTA
T$:B(9)=0:AT$="\":PRINT:RETURN
7000 'SWITCH LEVELS
7002 PRINT"Enter level. (1 to";L
V;") ";:GOSUB1500:Z=VAL(Z$):IF Z
<1 OR Z>LV THENPRINT"LVL Aborted
!":GOTO300ELSE LL=Z
7010 Z1$="LEVEL"+STR$(Y(15))+"/D
AT"
7015 PRINT"Saving this level":PR
INT"Start";STRING$(SZ-13," ");"F
inished"
7020 OPEN "O",#1,Z1$:FORX1=1TOSZ
:FORY1=1TOSZ:WRITE#1,G(X1,Y1):NE
XTY1:PRINT".";:NEXTX1:CLOSE#1
7040 PRINT:Z1$="LEVEL"+STR$(LL)+
"/DAT"
7045 PRINT"Loading level";LL:PRI
NT"Start";STRING$(SZ-13," ");"Fi
nished"
7050 OPEN"I",#1,Z1$:FORX1=1TOSZ:
FORY1=1TOSZ:INPUT#1,G(X1,Y1):NEX
TY1:PRINT".";:NEXTX1:CLOSE#1:Y(1
5)=LL:GOTO290
8000 '???
8010 Z=G(X,Y)-90
8020 IF Z=1 THENPRINT"An abandon
ed Flagship!!":Y(1)=Y(1)+1
8030 IF Z=2 THEN PRINT"A Space m
ine!!":Z1=RND(80000):PRINT"It ex
poded causing";Z1;"credits damag
e to your Flagship!":PRINT"I'm l
oaning you the money to get it r
epaired.":Y(8)=Y(8)+Z1
8040 IF Z=3 THENZ1=RND(5)+5:PRIN
TZ1;"fighters who join your flee
t!":Y(2)=Y(2)+Z1
8050 IF Z=4 THENPRINT"A Fairy Go
d Mother!":Z1=RND(20000)+20000:P
RINT"She gives you";Z1;"credits
cause you've been good!":Y(6)=Y(
6)+Z1
8060 IF Z=5 THEN PRINT"An Atomic
 explosion!!":PRINT"Your fleet s
uffered no damage but your turn
is over!":G(X,Y)=100+50+Y(0):GOT
O4820
8070 IFZ>5 THENPRINT"A treasure
chest!!":Z1=RND(20000):PRINT"It
has";Z1;"credits inside":Y(6)=Y(
6)+Z1
8080 G(X,Y)=0:GOTO290
8100 'TOP COMMAND
8105 PRINT" #  Name"," Credits":
PRINT
8110 FOR Z=1TO5:PRINTUSING"##";T
U(Z);:PRINT" "+TP$(Z),TP(Z):NEXT
:PRINT:RETURN
8200 'CAL COMMAND
8205 PRINT"The last 9 callers we
re:":PRINT
8210 FOR Z=0 TO8:PRINTLP$(Z):NEX
T:RETURN
9000 'LST COMMAND
9010 PRINT"Start at what player?
 (CR=1) ";:GOSUB1500:Z2=VAL(Z$):
IFZ2=0 THEN Z2=1 ELSE IF Z2>NR O
R Z2<0 THENPRINT"There are only"
;NR;"players!":GOTO9010
9020 PRINT"End at what player? (
CR=";NR;") ";:GOSUB1500:Z1=VAL(Z
$):IF Z1=0 THEN Z1=NR ELSE IF Z1
<0 OR Z1>NR THEN PRINT"Try again
!":GOTO9020
9030 OPEN"D",#1,"GALAXUSR/DAT",2
00
9040 FIELD#1,10AS A$,10 AS B$,80
 AS C$,100 AS D$
9050 FOR R=Z2 TO Z1:GET#1,R
9055 Z3=CVN(MID$(C$,56,5))
9060 PRINTR;A$;RK$(Z3):NEXT:CLOS
E#1:GOTO290
9100 OPEN "I",#1,"RULES/TXT"
9105 PRINT"Hit 'A' to abort":
9110 IF EOF(1)=-1 THEN 9140
9115 Z$=INKEY$:IFZ$="A"ORZ$="a"T
HEN9140
9120 LINE INPUT #1,A$:PRINTA$
9130 GOTO 9110
9140 CLOSE#1:RETURN
9999 PRINT:PRINT:PRINT"See ya la
ter!!":PRINT"Please hang up now.
":R=42:A1$=LD$:B1$=RK$:A(1)=CR:A
(2)=NR:A(3)=SZ:A(4)=LV:A(5)=NC:A
(6)=WG:GOSUB2100:RUN
10000 DATA Flagship(s),Fighter(s
),Cargo bay(s),Base kit(s),Base(
s),Credits on hand,Credits in ba
nk,Credits on loan
10001 DATA Cadet,Ensign,Leftenan
t,Commander,Captain,Admiral,Flee
t Admiral,Supream Admiral
10002 DATA 500000,1000000,200000
0,3000000,4000000,6000000,800000
0
```

# RAINBOW

*Give us your best:* Join the ranks of these courageous CoCoists in showing the Color Computer world your high score at your favorite micro-diversion. We want to put your best effort on record in THE RAINBOW's "Scoreboard" column. All entries must be received 60 days prior to publication. Entries should be printed — legibly — and must include your *full* name, address, game title, company name and, of course, your high score. Each individual is limited to three score entries per month. Send your entries to Scoreboard, c/o THE RAINBOW. The "Rainbow Scoreboard" is now a bimonthly feature.

For greater convenience, your high scores may also be sent to us through the MAIL section of our Delphi CoCo SIG. From the CoCo SIG> prompt, pick MAIL, then type `SEND` and address to: `EDITORS`.

★ Current Record Holder ● Shutout

**ADVANCED STAR*TRENCH** (THE RAINBOW, 7/86)

| | |
|---|---|
| 3,975 | ★David Schaller, Clarkston, WA |
| 3,960 | Maurice MacGarvey, Dawson Creek, British Columbia |
| 3,960 | Robbi Smith, Helena, HI |
| 3,800 | Shaw Muniz, Los Angeles, CA |
| 2,600 | John Fredericks, Kalkaska, MI |
| 2,450 | Blain Jamieson, Kingston, Ontario |

**ANDRONE** *(Radio Shack)*

| | |
|---|---|
| 107,901 | ★Steve Nealon, St. Louis, MO |
| 85,240 | Judy Haviland, Caldwell, ID |
| 81,375 | Corey Jackson, Monongahela, PA |
| 71,035 | Quinn Granfor, Bismark, ND |
| 63,600 | Maurice MacGarvey, Dawson Creek, British Columbia |
| 58,200 | Scott Bellman, Bettendorf, IA |

**BEAM RIDER** *(Spectral Associates)*

| | |
|---|---|
| 7,144,040 | ★Paul Bivens, Washington, PA |

**BIOSPHERE** *(Radio Shack)*

| | |
|---|---|
| 25,345 | ★Robert St. Pierre, Coventry, RI |
| 21,372 | Randall Edwards, Dunlap, KS |
| 14,186 | David Spalding, Galena Park, TX |
| 10,056 | Carlos Gameros, El Paso, TX |
| 3,822 | Kevin Hilton, Gurdon, AR |
| 3,101 | Vincent Knight, Harvey, IL |
| 2,491 | Robert de Lambert, Everett, WA |

**BOUNCING BOULDERS** *(Diecom)*

| | |
|---|---|
| 9,318 | ★Skip Taday, East Lyme, CT |
| 7,448 | Philip Manwarren, Harrington, ME |
| 3,994 | Louis Bouchard, Gatineau, Quebec |
| 1,561 | Lise Nantel, L'Acadie, Quebec |
| 36 | Andre Grenier, Quebec, Canada |

**BREWMASTER** *(Novasoft)*

| | |
|---|---|
| 120,375 | ★Thomas Crowe, Colombia, South America |

**BUBBLE WARS** (THE RAINBOW, 2/86)

| | |
|---|---|
| 52,100 | ★Daniel Cecil, Bardstown, KY |
| 42,800 | Blain Jamieson, Kingston, Ontario |
| 41,400 | Becky Rumpel, Arcadia, WI |

**BUSTOUT** *(Radio Shack)*

| | |
|---|---|
| 35,518 | ★Brian Matherne, Gretna, LA |

**BUZZARD BAIT** *(Tom Mix)*

| | |
|---|---|
| 22,931,850 | ★Skip Taday, East Lyme, CT |
| 763,550 | Geran Stalker, Rivordalo, GA |

**CANYON CLIMBER** *(Radio Shack)*

| | |
|---|---|
| 150,200 | ★Brian Lewis, Baltimore, MD |
| 145,800 | Darren King, Yorkton, Saskatchewan |
| 135,600 | Eric Rose, Grand Coulee, WA |
| 128,000 | Tony Bacon, Mt. Vernon, IN |
| 125,000 | Tony Fortino, Tacoma, WA |
| 112,700 | Jesse Binns, Phoenix, AZ |
| 110,400 | Alexander Chapman, Vancouver, British Columbia |
| 100,400 | Michelle Schiessl, Menasha, WI |

**CASTLE** (THE RAINBOW, 6/86)

| | |
|---|---|
| 326,352 | ★Richard Donnell, Penns Grove, NJ |
| 228,622 | John Broussard Jr., Alexandria, LA |
| 202,659 | Brendan Powell, La Grande, OR |
| 116,606 | Darryn Bearisto, New Carlisle, Quebec |
| 93,672 | Maurice MacGarvey, Dawson Creek, British Columbia |

**CLOWNS and BALLOONS** *(Radio Shack)*

| | |
|---|---|
| 63,750 | ★Steve Fraser, Pickering, Ontario |
| 18,470 | James Leistico, Lompoc, CA |
| 15,350 | Christopher Heston, Louisville, KY |
| 11,650 | Cliff Armoogan, Las Vegas, NV |

**COLOR BASEBALL** *(Radio Shack)*

| | |
|---|---|
| 999-0 | ★●Erik Munson, Tucson, AZ |
| 999-0 | ★●Danny Wimett, Rome, NY |
| 998-0 | ●Eugene Paoli, Wilmington, DE |
| 982-0 | ●Geran Stalker, Rivordalo, GA |
| 866-1 | Ghislain Chillis, Trois-Rivieres, Quebec |
| 814-0 | ●John Licata, Richton Park, IL |
| 814-1 | Frank D'Amato, Brooklyn, NY |
| 800-0 | ●Curtis Schaaf, Moro, IL |

**COLOR CAR** *(Novasoft)*

| | |
|---|---|
| 209,381 | ★Roger Rosebrock, Leipsic, OH |

**CRYSTLE CASTLES** *(ThunderVision)*

| | |
|---|---|
| 554,979 | ★Patrick Martel, Laval, Quebec |

**DALLAS QUEST** *(Radio Shack)*

| | |
|---|---|
| 86 | ★Melanie Moor, Florence, AL |
| 87 | Douglas Bell, Duncan, OK |
| 87 | David and Shirley Johnson, Leicester, NC |
| 87 | Paul Summers, Orange Park, FL |
| 89 | Chris Piche, White Rock, British Columbia |
| 89 | Milan Parekh, Fullerton, CA |
| 89 | Andrew Urquhart, Metairie, LA |
| 89 | Steve Zemaitis, Howell, MI |
| 90 | Roy Grant, Toledo, OH |
| 91 | John Semonin, Akron, OH |

**DECATHALON** *(Spectral Associates)*

| | |
|---|---|
| 10,368 | ★Sylvain Duguay, St. Bruno, Quebec |

**DEFENSE** *(Spectral Associates)*

| | |
|---|---|
| 16,305 | ★Patrick Martel, Laval, Quebec |

**DEMOLITION DERBY** *(Radio Shack)*

| | |
|---|---|
| 210,700 | ★Duke Davis, Sandwich, IL |
| 124,000 | Judy Haviland, Caldwell, ID |
| 16,100 | Christopher Heston, Louisville, KY |

**DEMON ATTACK** *(Imagic)*

| | |
|---|---|
| 28,780 | ★Daniel Streidt, Cairo, Egypt |
| 4,960 | Laundre Clemon, Sacramento, CA |

**DEVIL ASSAULT** *(Tom Mix)*

| | |
|---|---|
| 1,866,100 | ★Stephane Martel, Laval, Quebec |
| 623,550 | Dale Krueger, Maple Ridge, British Columbia |
| 75,000 | Blake Cadmus, Reading, PA |
| 59,200 | Stephane Martel, Laval, Quebec |

**DISCRIMINATION** (THE RAINBOW, 1/87)

| | |
|---|---|
| 15 | ★Patrick Martel, Laval, Quebec |

**DOUBLE BACK** *(Radio Shack)*

| | |
|---|---|
| 34,560 | ★Laundre Clemon, Sacramento, CA |

**DOWNLAND** *(Radio Shack)*

| | |
|---|---|
| 99,980 | ★Danny Wimett, Rome, NY |
| 98,985 | Karl Gulliford, Summerville, SC |
| 97,740 | Stephane Deshaies, Beloeil, Quebec |
| 89,490 | Neil Edge, Williston, FL |
| 77,254 | Tom Audas, Fremont, CA |
| 73,346 | Jean-Francois Morin, Loretteville, Quebec |
| 70,142 | Chris Goodman, Baltimore, MD |
| 68,142 | Cooper Valentin, Vavenby, British Columbia |
| 67,721 | Keith Yampanis, Jaffrey, NH |
| 62,442 | Eddie Lawrence, Pasadena, Newfoundland |
| 55,300 | Patrico Gonzalez, Buenos Aires, Argentina |
| 49,500 | Danny Perkins, Clifton Forge, VA |
| 43,502 | Mike Ells, Charlotte, MI |
| 41,896 | Antonio Hidalgo, San Jose, Costa Rica |
| 40,360 | Jesse Binns, Phoenix, AZ |
| 34,424 | Andrea Mayfield, Melbourne, FL |
| 25,147 | Timothy O'Neal, Commerce, TX |
| 21,527 | Scott Godfrey, Nashua, NH |
| 19,835 | Christopher Heston, Louisville, KY |
| 18,251 | Sam DiCerce, Willowich, OH |
| 17,120 | Kay McCluskey, Remsen, NY |

**DRAGON BLADE** *(Prickly-Pear)*

| | |
|---|---|
| 69 | ★Jason Damron, Folsom, CA |

**DRAGON FIRE** *(Radio Shack)*

| | |
|---|---|
| 146,325 | ★Stephane Martel, Laval, Quebec |
| 5,561 | Chris Lorenz, Kiester, MN |

**ENCHANTER** *(Infocom)*

| | |
|---|---|
| 400/212 | ★Charly Rushing, Santa Rosa, CA |
| 400/621 | Brad Wilson, Lithia Springs, GA |
| 400/431 | Truman Bryerton, Jr., B,Ville, NY |
| 224/358 | Joseph Delaney, Augusta, GA |
| 185/186 | David Tarleton, Williamsburg, VA |

**ESCAPE 2012** *(Computerware)*

| | |
|---|---|
| 202 | ★Roy Grant, Toledo, OH |

**EVICTOR** (THE RAINBOW, 7/86)

| | |
|---|---|
| 12,915 | ★Spencer Metcalf, Longview, TX |
| 10,560 | Patricio Gonzalez, Buenos Aires, Argentina |

**FALCON'S LAIR** (THE RAINBOW, 8/85)

| | |
|---|---|
| 45,425 | ★Talib Khan, Bronx, NY |

**FIRE COPTER** *(Adventure International)*

| | |
|---|---|
| 64,710 | ★Phillip Gregory, Moultrie, GA |

**FIRESTORM** (THE RAINBOW, 1/86)

| | |
|---|---|
| 8,910 | ★Stephane Martel, Laval, Quebec |
| 5,680 | Kathy Rumpel, Arcadia, WI |
| 3,760 | Rick Beevers, Bloomfield, MN |
| 3,505 | Blake Cadmus, Reading, PA |

**GALACTIC ATTACK** *(Radio Shack)*

| | |
|---|---|
| 26,370 | ★Jeff Remick, Warren, MI |
| 9,930 | Daniel Streidt, Cairo, Egypt |

**GALAGON** *(Spectral Associates)*

| | |
|---|---|
| 328,820 | ★Bernard Burke, Lee's Summit, MO |
| 249,960 | Matthew Fumich, Munford, TN |
| 169,410 | Danny Dunne, Pittsfield, NH |
| 149,520 | Vernon Johnson III, Parkville, MD |
| 116,280 | Scott Jamison, Billerica, MA |
| 107,570 | Kyle Madruga, Hanford, CA |
| 104,870 | Chris Dunne, Pittsfield, NH |
| 99,100 | Mark Kingsley, Mississauga, Ontario |
| 98,770 | Etienne Duguay, St. Bruno, Quebec |
| 73,520 | Neil Edge, Williston, FL |

**GALAX ATTACK** *(Spectral Associates)*

| | |
|---|---|
| 236,350 | ★Corey Leopold, Nada, TX |

**GALLOPING GAMBLERS** (THE RAINBOW, 12/85)

| | |
|---|---|
| 3,427,660 | ★Sean Lair, Ewing, MO |

**GANTELET** *(Diecom Products)*

| | |
|---|---|
| 23,643,720 | ★Geran Stalker, Rivordalo, GA |
| 20,921,490 | Randall Edwards, Dunlap, KS |
| 10,222,940 | Clinton Morell, Sacramento, CA |
| 10,020,500 | Ken Hubbard, Madison, WI |
| 7,493,340 | Stirling Dell, Dundalk, Ontario |
| 2,626,950 | Jonathon Ross, Pocomoke City, MD |
| 2,512,620 | Jason Steele, Pensacola, FL |
| 2,312,640 | Rory Kostman, Hershey, NE |
| 2,115,790 | Jerry Honigman, Waggoner, IL |
| 2,011,200 | Jerry Colbert, Bakersfield, CA |
| 1,108,750 | Robert Fox, Dover, OH |
| 1,094,280 | Donnie Pearson, Arvada, CO |
| 1,081,530 | Michael Wallace, Bronx, NY |

# SCOREBOARD

1,025,900 John Hotaling, Duanesburg, NY
1,016,050 Edward Swatek, Chicago, IL
933,740 Yvan Langlois, Laval, Quebec
932,660 Brian Hunter, South Berwick, ME
787,780 Brad Wilson, Lithia Springs, GA
685,840 Karen Jessen, Cleveland, OH
667,390 Robbie Smith, Helena, HI
456,220 Scott Jamison, Billerica, MA
410,868 Billy Helmick, Independence, KY
79,570 David Gordon, Pierre, SD

**GHANA BWANA** *(Radio Shack)*
523,080 ★Joseph Delaney, Augusta, GA
252,840 Edward Rocha, Cobleskill, NY

**GRABBER** *(Tom Mix)*
432,650 ★Matthew Fumich, Munford, TN

**HALL OF THE KING** *(Prickly-Pear)*
107 ★Joshua Wanagel, Freeville, NY

**HOME ROW BOMBER** (THE RAINBOW, 1/87)
6,384 ★Timothy Hennon, Highland, IN
2,420 Stephane and Patrick Martel, Laval, Quebec

**JOKER POKER** (THE RAINBOW, 3/87)
2,793,285 ★Blain Jamieson, Kingston, Ontario

**JUNIOR'S REVENGE** *(Computerware)*
2,503,000 ★Stephane Martel, Laval, Quebec
257,600 Keith Cohen, Rocky Mount, NC

**JUNKFOOD** (THE RAINBOW, 11/84)
18,650 ★Daniel Streidt, Cairo, Egypt

**KARATE** *(Diecom Products)*
11,600 ★Jonathon Ross, Pocomoke City, MD
6,300 David Darling, Longlac, Ontario

**THE KING** *(Tom Mix)*
3,824,280 ★Andre Grenier, Quebec, Canada
22,400 Spencer Metcalf, Longview, TX

**KORONIS RIFT** *(Epyx)*
84,830 ★Thomas Beruheimer, Yoru, PA
84,070 David Spalding, Galena Park, TX
33,900 Steven Moreno, Stockton, CA
11,430 Timothy Hennon, Highland, IN
2,785 Tony Rapson, Tulsa, OK

**LANCER** *(Spectral Associates)*
567,200 ★Luke Birinyi, Pefferlaw, Ontario
227,800 Andre Grenier, Valleyfield, Quebec
178,800 Christian Grenier, Valleyfield, Quebec
99,700 David Kauffman, South Haven, MI

**LUNAR RESUCE** (THE RAINBOW 8/87)
113,579 ★Jeff Remick, Warren, MI

**LUNCHTIME** *(Novasoft)*
55,550 ★Richard Deane, Chicago, IL
42,025 Steve Place, Webster, NY
26,425 Joshua Conley, Springfield, OH
18,225 Charles Julian, Chicago, IL

**MICROBES** *(Radio Shack)*
337,880 ★Judy Haviland, Caldwell, ID
151,420 James Leistico, Lompoc, CA
121,330 Minesh Patel, Benton, AR
77,700 Brian Abeling, Monticello, IA

**MISSION: F-16 ASSAULT** *(Diecom Products)*
468,750 ★Karen Jessen, Cleveland, OH
355,570 Stirling Dell, Dundalk, Ontario
318,160 Jeremy Pruski, Sandwich, IL
137,920 Mike Grant, Fresno, CA
127,550 Michael Heitz, Chicago, IL
120,670 Vernon Johnson III, Parkville, MD
49,630 Edward Swatek, Chicago, IL
45,500 Chuck Morey, Bakersfield, CA
45,375 Chris Wright, New Albany, IN

**MUDPIES** *(MichTron)*
486,500 ★Stephane Martel, Laval, Quebec

**MUNCHKIN BLASTER** (THE RAINBOW 8/87)
7,240 ★Jeff Remick, Warren, MI

**NUKE AVENGER** *(T&D Software)*
60,250 ★Doug Lute, Clymer, PA

**OMNIVERSE** *(Computerware)*
112 ★Roy Grant, Toledo, OH

**ONE-ON-ONE** *(Radio Shack)*
1,276-0 ★•Jonathan Dorris, Indianapolis, IN
1,210-0 •Gregg Thompson, Chesterfield, VA
1,204-0 •Chad Johnson, Benton, AR
1,160-0 •Mark Lang, Downieville, CA
1,132-23 Dan Liffmann, Andover, MA
1,106-15 Rick Beevers, Bloomfield, NM
1,086-17 David Blankenship, Princeton, WV
1,078-2 Toby Jacobs, Bellefontaine, OH
1,064-16 Tim DeJong, Rock Valley, IA
1,028-60 Jamie Keels, Gulfport, MS
54-0 •Walter Hearne, Pensacola, FL

**PAPER ROUTE** *(Diecom Products)*
1,120,350 ★Neil Haupt, Elyria, OH
1,059,350 David Kauffman, South Haven, MI
830,950 Christopher Darden, Woodson Terrace, MO
720,560 Konnie Siewierski, Schaumburg, IL
531,600 Larry Shelton, Marion, IL
160,450 Holly Forsberg, Wheaton, IL

**PEGASUS AND THE PHANTOM RIDERS** *(Radio Shack)*
303,100 ★Mike Grant, Fresno, CA
244,100 Martinez Domingo, Miami, FL

**PINBALL** *(Radio Shack)*
213,300 ★Patrick Martel, Laval, Quebec
142,400 Thomas Payton, Anderson, SC

**PITSTOP II** *(Epyx)*
54 ★Rusty Breitbach, Rickardsville, IA
54 ★Walter Hearne, Pensacola, FL
51 Christian Grenier, Valleyfield, Quebec
9 Laundre Clemon, Sacramento, CA

**POLARIS** *(Radio Shack)*
161,198 ★Danny Remick, Warren, MI

**POLTERGEIST** *(Radio Shack)*
4,855 ★Darcy Gifford, Portland, OR
4,080 Alphonse Brown, Houston, TX

**POOYAN** *(Datasoft)*
99,500,300 ★Danny Wimett, Rome, NY
97,500,000 Rich Fiore, Clemson, SC
54,500,000 Carlos Gameros, El Paso, TX
3,785,000 Ben Collins, Clemson, SC
1,987,000 Jon Sowle, Sanford, FL
1,546,000 Jason Maxwell, Manchester, TN
709,750 Shawn Bonning, Sayre, PA

**POPCORN** *(Radio Shack)*
94,470 ★Patrick Martel, Laval, Quebec

**PYRAMID 2000** *(Radio Shack)*
100 ★Peter Antonacopoulos, Toa Baja, Puerto Rico

**QUIX** *(Tom Mix)*
8,407,772 ★John Haldane, Tempe, AZ
1,404,000 Curtis Goodson, Sao Paulo, Brazil
1,003,104 Elisa Goodson, Sao Paulo, Brazil
205,335 John Hotaling, Duanesburg, NY
104,034 Christopher Conley, North Attleboro, MA
38,957 Patrick Martel, Laval, Quebec
19,410 Thomas Crowe, Colombia, South America

**RADIO BALL** *(Radio Shack)*
6,330,350 ★Myriam Ferland, Trois-Rivieres, Quebec
4,510,740 Les Dorn, Eau Claire, WI
1,945,110 Dominic Deguire, St. Basile, Quebec
1,768,940 Brian Buss, Whitehall, PA
1,631,750 David Del Purgatorio, Antioch, CA

**RAIDERS** (THE RAINBOW, 11/86)
2,100 ★Dave Allessi, Iselin, NJ

**RESCUE ON FRACTALUS** *(Epyx)*
48,445 ★Steven Moreno, Stockton, CA

**ROGUE** *(Epyx)*
17,851 ★Yvan Langlois, Laval, Quebec
8,812 Allen Houk, San Diego, CA
6,576 Kirk Marshall, Westport, MA
5,679 David Spalding, Galena Park, TX
5,369 John Moore, Ottawa, OH

**SANDS OF EGYPT** *(Radio Shack)*
82 ★Edward Rocha, Cobleskill, NY
87 Neil Haupt, Elyria, OH

**SANDWORM** (THE RAINBOW, 8/86)
737 ★Becky Rumpel, Arcadia, WI
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120,480 ★Lynn Shrewsberry, Sunnyside, WA
47,260 Jamie Keels, Gulfport, MS
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130,720 Patricio Gonzalez, Buenos Aires, Argentina

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6,500 ★Daniel Streidt, Cairo, Egypt

**— Jody Doyle**

# SCOREBOARD POINTERS

In conjunction with THE RAINBOW's Scoreboard, which appears bimonthly, we offer this column of pointers for our game-playing readers' benefit. If you have some interesting hints, tips or responses to questions, or want help yourself, we encourage you to write to the Scoreboard, c/o THE RAINBOW.

### FEEDBACK

In response to questions from:

- David Davidson: In *Sands of Egypt*, the scepter is at the pyramid. The rope that crumbles to dust is of no use. You need to get the palm fronds and make a good rope.

  In *Shenanigans*, to get the pole inside the cave, leave it in the cabin and go back inside the cave and open the trapdoor. Then go up and get the pole and go back through the trapdoor.

- Bo Van Cleave: In *Pyramid 2000*, after you get the key, go and open the sarcophagas and go down and get the pearl. The scepter makes a bridge fall.

- Sean McDonough: In *Infidel*, to find the pyramid you must dig. After you find it, put the stone cube in the empty hole.

- David Hill: In *Vortex Factor*, feed the sandwich to the mutant. He will give you the cartridge to get to Cairo Moon. You don't need to read the hieroglyphics on the ring.

- Dale Kaczmarek: In *Hitchhiker's Guide to the Galaxy*, the plotter is in the Klingon hold. When you get the babble fish, wait until you get taken to the captain. Wait until he reads poetry and type `ENJOY POETRY`. Keep typing this until he gets to the second verse, then read it carefully.

- Harry Keener: In *Dragon Blade*, you need the sword. The sword is in the abandoned mine.

*Don Grey*
*Austell, GA*

*Scoreboard:*

In *Arcon*, I can wander through the bedroom, garden, roof, garbage compactor, field, mousehole, tool shed and the meat shed, but I can't go any farther.

*Julie Finn*
*Ft. Smith, AR*

*Scoreboard:*

In the third chapter of *War of the Worlds*, I can't find the bunker. I know that I need to get into the bunker so I can exchange my gold disk for a silver one from Xad.

*Darcy Gifford*
*Portland, OR*

*Scoreboard:*

In *War of the Worlds*, to get the farmer's children, go east from the plane and look.

How do you get to the plane and cross the river?

*Doug Elmer*
*Lancaster, PA*

*Scoreboard:*

In *Wishbringer*, I can't get out of the fuzzy room in the tower and the library/museum. I think it has something to do with the 3D glasses, but I can't find them.

*Marc Prud'hommeaux*
*Winter Harbor, ME*

*Scoreboard:*

How do you shatter the backboard and get three points on *One-On-One*?

*Mark Fernandes*
*N. Dartmouth, MA*

*Scoreboard:*

In *Dr. Avaloe*, to get out of the first room, type `OPEN HOLE`. After you get out, you'll be in a room that you have to get out of right away by falling into a secret trapdoor that will be randomly selected somewhere in the room. You will have to avoid the invisible monsters.

How do you get over the rug in *Raaka-Tu* and how do you kill Zaxxon itself in *Zaxxon*?

*Shawn Pitman*
*San Diego, CA*

*Scoreboard:*

In *Paramission*, try to jump out of the plane and go most of the way to the platform without your parachute. On the low levels, it helps to avoid the bomb.

On *Gantelet*, try to save the potions to kill Death or when your health is low.

*Clinton Morell*
*Sacramento, CA*

*Scoreboard:*

In *Dungeons of Daggorath*, I can only kill all the monsters on the first level and then go down a level and only kill vipers; all the rest kill me before I can get enough shots in. Help!

*Darren King*
*Yorkton, Saskatchewan*

*Scoreboard:*

In *Dungeons of Daggorath*, don't use a flask unless you know what type it is. The Hale and Thews flask will aid you. The Abyes will not. Hale means to render immune to disease. An Aby is a penalty. Thews are sinews and tendons.

*Tim Hennon*
*Highland, IN*

*Scoreboard:*

In *Rogue*, the Aquadors can't take points off the plain leather armor. Start shooting the leprechauns and nymphs at a distance. If you kill them before they can steal from you, the leprechauns will leave gold and the nymphs will usually leave a magical item. Don't vaporize a weapon twice because this will make your weapon disappear in a puff of smoke.

For the scare monster scroll, you have to drop it. Do not try to pick it back up though, or it will turn to dust. To use it again in the same level, go back to the scroll and press G and move on top of the scroll.

I've had the amulet before, but what can you do with it? I found that there are more than 26 levels, but is it possible to kill the dungeon lord? Is there a way to stop the Medusa's gaze from confusing you? What comes after the ranks of warlord and hero?

*Quinn Granfor*
*Bismarck, ND*

*Scoreboard:*

In *Pyramid*, to get around the serpent, find the bird and type `THROW BIRD`. You shouldn't do anything to the mummy because, if you do, you will be unable to get to the treasure chest. Go into the maze and you will find the treasure chest.

How do you get the coins out of the machine after you get the batteries? How do you feed the sarcophagus?

In *Bedlam*, how do you to wake up the unconscious doctor? If the doctor stings you with his hypo, type `PLUGH` or you aimlessly move around.

In *Dungeons of Daggorath*, to go to Level 4, there is no hole to climb. You have to kill the wizard's image first with the fire ring.

Watch out, you have no objects to stall the creatures on Level 4, so use the spider as your guide.

Where is the ring in Level 3 and where is the elvish sword?

In *Madness and the Minotaur*, if you drop everything and still cannot open the crypt, you must get your strength to over 250. To light the tower room, get the treasure and go to the packrat in the forest. The powerful force in the second level will be conquered if you have the scepter.

If you have the jewelbox, open it in the minotaur's lair. If you look at the tablet, it disappears. Something else happened when I looked at the tablet in the chamber with the carvings. I used `AKHIROM` on the scarab and it glowed. What do I do with the glowing scarab? How do I get through the magic spells that push me out of the room?

*John Howell*
*Montreal, Quebec*

*Scoreboard:*

In *Pyramid 2000*, what do I do with the pillow and the magazine? What do I do to the plant? I can find the vending machine in the maze, but I can't find where the mummy puts the treasure.

*Matt Swift*
*Longview, TX*

*Scoreboard:*

In *Raaka-Tu*, drop the ring and then pick it up again. You will be back in the room where you found the ring. The food is useless. Once you find the secret passage, make sure you have all the treasure. Go through the passage to the outside.

What do you do after that?

In *Sands of Egypt*, you must get the canteen and go to the pool. Once you are there, type `FILL CANTEEN`, `GET CANTEEN` and `DRINK`. Only take the torch into the treasure room and when you leave, take the torch and the ladder only. The ax is on top of the pyramid. The dates are in the tree.

In *Pyramid 2000*, drop the scepter before you get the statue.

In *Sea Quest*, there is no key to the beach house. You must break the window with the shovel. The shovel is the thing that you trip over behind the falls.

*Matthew Fumich*
*Munford, TN*

*Scoreboard:*

In *Black Sanctum*, I have the boards, nails, saw and hammer, but I cannot convince the game to make an altar. What have I missed?

*Deborah Micallef*
*Kapuskasing, Ontario*

*Scoreboard:*

In *Dallas Quest*, when you meet the anaconda, type `TICKLE CHIN`. To make Roger cooperate and get past the cannibals to get into the cave, type `WAVE RING`.

In *Madness and the Minotaur*, I have the basket and the mushroom and took them to the Air of Enchantment, but I didn't get the spell.

*Mark Bollinger*
*Baltimore, MD*

*Scoreboard:*

I have the oil and I am by the pyramid in *Sands of Egypt*, then I find the scepter. What do I do next?

*Eddie Baker*
*Lincoln Park, NJ*

*Scoreboard:*

In *Sands of Egypt*, I can't find the oasis, pool, dates, pyramid or the container.

*Duane Fair*
*Joshua, TX*

*Scoreboard:*

In *Treasures of the Enrakian Empire*, I can't find any treasures except for the rose and the magic glove.

In *The Crown of Merrow*, I can't get across the river, and in *Le Lutin*, I can't get through the caves.

*Scott Godfrey*
*Nashua, NH*

*Scoreboard:*

In *Alton*, how do you get there?

*Andrew Bryan*
*Springhill, Novia Scotia*

*Scoreboard:*

I just bought *Flight Simulator I*. As I began reading through the booklet, it mentioned a map. I looked through everything it came with and there wasn't one. Should there be one?

*Paul Blount*
*Woodruff, WI*

*Scoreboard:*

To get more fuel in *Zaxxon*, shoot the fuel tanks. Doing this will give you fuel and points.

*Matthew Healey*
*Grand Junction, CO*

*Scoreboard:*

In *Halls of Dungeon Death*, from *The Second Rainbow Book of Adventures*, my sword is blunted and I am out of potions. The golem on Level 4 keeps doing me in, and I can't lay a finger on him. All I get when I attack it is, "You haven't even scratched him!" How do you get past the golem?

*William Grace*
*St. Joseph, MI*

*Scoreboard:*

In *Hitchhiker's Guide to the Galaxy*, I can open the door in the heart of gold ship, and it asks me to show it some intelligence. How do I open it and get in?

*Brad Booth*
*Cortland, NY*

*Scoreboard:*

I can get the map from Jenny, but I don't know what to do after that in *Wild West*. Every time I go out in the desert I die, and every time I go to the alley, one of Bart's men shoots me. What do I do with the map and how do I find the treasure?

In *Magic of Zanth*, I can get as far as the lake. How do I find what's under the water and how do I get past the lake?

*Chris Foster*
*Texarkana, TX*

*Scoreboard:*

In *Adventure in Mythology*, you must have the key and the feather before you get to the village. At the village, type `GO SCULPTURE`. Kill the statue and go to the castle. Once you're inside, go to the dining room and get the golden apples. At the labyrinth, to light the torch, strike the rock with the knife. When it says "against what?" type `ROCK`. You must find Ariadne before you see the minotaur. Ariadne will give you a sword.

In *Wrestle Maniac*, you must move your man behind your opponent and you must be facing the screen. Hold down the button and move the joystick down.

*Rusty Merritt*
*Pocomoke, MD*

**To respond to other readers' inquiries and requests for assistance, reply to "Scoreboard Pointers," c/o THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We will immediately forward your letter to the original respondent and, just as importantly, we'll share your reply with all "Scoreboard" readers in an upcoming issue.**

**For greater convenience, "Scoreboard Pointers" and requests for assistance may also be sent to us through the MAIL section of our Delphi CoCo SIG. From the CoCo SIG> prompt, pick MAIL, then type `SEND` and address to: `EDITORS`. Be sure to include your complete name and address.**

**— Jody Doyle**

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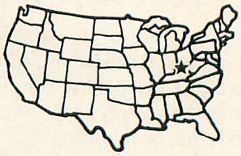

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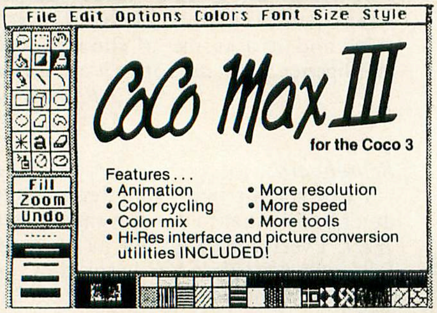

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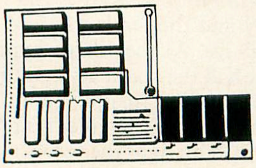

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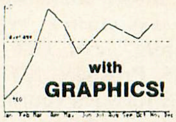

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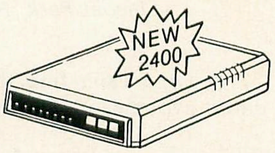

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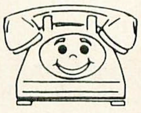

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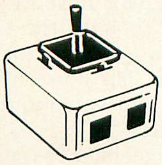

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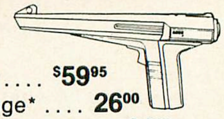

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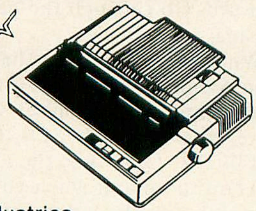

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# NOVICES NICHE

THE RAINBOW is a teaching environment and we realize that the majority of our readers will always be beginners. In our continuing effort to always keep the new user in mind, and in addition to the many beginner feature articles and programs published in every issue, "Novices Niche" contains shorter BASIC program listings that entertain as well as help the new user gain expertise in all aspects of the Color Computer: graphics, music, games, utilities, education, programming, etc.

# Giving Thanks for the BASICs

## Communications Security

### Personal Password Protector

4K

**By Doug Anderson**

Some computer information services require you to have both a user ID number (or USERNAME) and a secret password to get into the system. For security reasons, these services advise you to change the password on a regular basis.

However, choosing a password can be a tricky business. While avoiding any related or common phrases, you still need to pick a password that can be remembered. Thus, ROMEO+JULIET and KZALF/BPZO are excluded.

*Personal Password* is a utility to generate a random pair of passwords. For demonstration purposes, I used the 26 words that comprise the phonetic alphabet. You should pick 26 other words. Sources for other words might include frequently used personal names, or the first 26 words of a randomly selected novel ("Call me Ishmael").

The program will automatically generate 12 combinations of words. Pick the combination you like and discard the rest. Don't keep the list, and don't use each of the 12 in order. It's too likely that the list could be compromised. For security reasons, store the password and your user ID number in separate places. Finally, if you use a CB-type "handle" (e.g., a username) in bulletin boards, *don't* use your secret password. Printing your list is optional; see Line 80.

The protocol for "entering the net" varies among the information services. Before using this program, be sure that you understand what the particular service requires by way of a secret password.

**The listing:** PASSWORD

```
10 REM PERSONAL PASSWORD WAS WRI
TTEN BY DOUG ANDERSON.  VERSION
1.1.  COPYRIGHT 1986.
20 CLS:CLEAR 5000:E=0:FOR X=1 TO
 12
30 A=RND(26):FOR B=1 TO A:READ C
$:NEXT B
40 IF E<1 THEN RESTORE:E=E+1:D$=
C$:GOTO 30
50 IF C$=D$ THEN RESTORE:GOTO 30
60 RESTORE:F=26:FOR G=1 TO F:REA
D E$:NEXT G
70 F=RND(14):FOR G=1 TO F:READ E
$:NEXT G
80 PRINT C$;E$;D$:PRINT#-2,C$;E$
;D$
90 E=0:RESTORE:NEXT X:PRINT#-2:E
ND
100 DATA ALPHA,BRAVO,CHARLIE,DEL
TA,ECHO,FOXTROT,GOLF,HOTEL,INDIA
,JULIET,KILO,LIMA,MIKE,NOVEMBER,
OSCAR,PAPA,QUEBEC,ROMEO,SIERRA,T
ANGO,UNIFORM,VICTOR,WHISKEY,XRAY
,YANKEE,ZEBRA
110 DATA !,#,$,%,&,(,),*,=,+,<,>
,?,/
```

# CoCo 3 Graphics

## Tunnel Effects

CoCo 3

### By Ken Ferreira

Both *Circle* and *Circle 2* create Hi-Res concentric circles that make you feel like you're rushing through a tunnel. The effect is mesmerizing. Don't stare at the screen too long — you may not be able to tear yourself away.

The graphics are created with the `HCIRCLE` command. Experiment with *Circle* by changing the value of `R` in Line 30 to 90, 50 or 150.

*Circle 2* works similarly, but uses the `PALETTE` command for an interesting effect. Also experiment with the `R` value in Line 30. You'll be surprised at what CoCo 3 can do.

**Listing 1:** `CIRCLE`

```
1 'KEN FERREIRA (C) 1987
5 PALETTE RGB:POKE 65497,0
10 ON BRK GOTO 2500:POKE 65497,0
20 PALETTE RGB:HSCREEN 2
30 HCLS 8
40 FOR R=1 TO 193 STEP 1
50 C=RND(15)
60 HCIRCLE(160,96),R,C
70 NEXT R
80 GOTO 80
2500 POKE 65496,0:END
```

**Listing 2:** `CIRCLE2`

```
1 ' KEN FERREIRA (C) 1987
5 ON BRK GOTO 2500:POKE 65497,0
10 PALETTE RGB:HSCREEN 2
20 HCLS 8
30 FOR R=1 TO 192 STEP 1
40 C=RND(15)
50 HCIRCLE(160,96),R,C
60 NEXT R
70 PALETTE RND(15),RND(63)
80 GOTO 70
2500 PALETTE RGB:POKE 65496,0:EN
D
```

---

## One Starry Night

CoCo 3

### By Jim McDowell

Fall skies bring with them meteor showers. This program for the CoCo 3 simulates stargazing on a moonlit night. Watch the stars twinkle and maybe you'll even see a shooting star!

Each portion of the listing is labeled so you can identify which part does what. The program uses palette switching to show stars twinkling, and demonstrates use of the `HCIRCLE` command in simulating shooting stars.

**The listing:** `STARS`

```
0 '***** ONE STARRY NIGHT *****
1 '
2 '(C) 1987 BY JIM MCDOWELL
3 '          JML SOFTWARE DESIGN
4 '
5 '*****************************
6 HSCREEN2
7 PALETTE 9,16 : PALETTE 10,32 :
 PALETTE 12,63
8 HCLS8
9 GOSUB 27
10 FOR I=1 TO 50
11 IF RND(5)>1 THEN C=4 ELSE C=1
1
12 HSET(RND(320)-1,RND(192)-1,C)
13 NEXTI
14 FOR I=1TORND(2000)+500:NEXT
15 ON RND(4) GOTO 17,17,17,20
16 '***** TWINKLE STARS *****
17 PALETTE11,1:PALETTE11,63
18 GOTO 14
19 '***** SHOOTING STAR *****
20 X=RND(220)+50 : Y=RND(96)+40
21 R=RND(50)+99 : S=RND(0) : E=S
+.2
22 HCIRCLE (X,Y),R,4,.9,S,E
23 HCIRCLE(X,Y),R,8,.9,S,E
24 GOSUB 27
25 GOTO 15
26 '***** DRAW MOON *****
27 HCIRCLE(96,56),30,4,.9
28 HCIRCLE(80,50),5,4
29 HPAINT(80,50),9,4
30 HCIRCLE(95,60),7,4
31 HPAINT(95,60),9,4
32 HCIRCLE(96,35),10,4,.9,.93,.6
33 HPAINT(96,35),10,4
34 HCIRCLE(113,56),9,4
35 HPAINT(113,56),10,4
36 HCIRCLE(104,74),6,4
37 HPAINT(104,74),9,4
38 HCIRCLE(80,63),5,4
39 HPAINT(70,50),12,4
40 RETURN
```

## Alphabet Roulette

4K

### By Keiran Kenny

The object of *Alfaword* is to type one or more words using each letter of the alphabet just once. The alphabet is displayed in a row at the top of the screen. As you type a letter, it is erased from the row and cannot be used again. But you can type double consonants in a word: thus you can type PAL or PALL. Use the delete key if you want to erase a word or letter.

Press ENTER when you complete one word, and then type your next one. When you cannot make a word out of the remaining letters in the alphabet row, press the space bar. Your score is the number of letters you have used. Double letters count as one letter. It will be left up to you to decide if what you type is a real word!

**The listing:** ALFAWORD

```
0 'ALFAWORD: BY KEIRAN KENNY,
   THE HAGUE, 1986.
10 CLS
20 DIMA$(104)
30 X=3:R=67
40 FORA=65TO90:PRINT@X,CHR$(A):X
=X+1:NEXT
50 Q=R
60 K$=INKEY$:IFK$=""THEN60
70 IFQ<R THENQ=R
80 J=J+1
90 IFK$=A$(J-1)THENSC=SC-1:GOTO1
20
100 IFPEEK(1024+ASC(K$)-62)=143T
HEN60
110 N=ASC(K$):P=N-62
120 IFK$=CHR$(13)THEN170ELSEIFK$
=CHR$(32)THEN180ELSEIFK$<>CHR$(8
)ANDK$<"A"ORK$>"Z"THEN60
130 IFK$=CHR$(8)ANDPEEK(1024+Q-1
)=PEEK(1024+Q-2)THENPRINT@Q-1,CH
R$(143):Q=Q-1:GOTO60ELSEIFK$=CHR
$(8)THENPL=PEEK(1024+Q-1):PRINT@
Q-1,CHR$(143):Q=Q-1:POKE1024+ASC
(CHR$(PL))-62,PL:SC=SC-1:GOTO60
140 PRINT@Q,K$;:PRINT@P,CHR$(143
);:A$(J)=K$
150 Q=Q+1:SC=SC+1:IFSC=26THEN180
160 GOTO60
170 R=R+32:GOTO50
180 PRINT@R+32,TAB(3)"SCORE:"STR
$(SC)" LETTERS."
190 PRINTTAB(3)"PRESS ANY KEY."
200 EXEC44539:K$=INKEY$:SC=0:CLS
:GOTO30
```

---

## The Blue Block Blues

4K

### By J.R. Moon

You are a blue block, and your only goal in life is to stay away from those awful orange squares that just won't leave you alone. Life is cheap in this game, but so is reincarnation.

Use the left and right arrow keys to maneuver your block. The more orange squares you dodge, the higher your score.

To change your block's or the squares' colors, alter the values for ME$, X$ and the POINT command.

**The listing:** DODGE

```
10 'dodge' BY JEREMY MOON
20 POKE 65494,0
30 CLS
40 KK=16
50 ME$=CHR$(239)
60 X$=CHR$(255)
70 PRINT"WELCOME TO 'DODGE'":PRI
NT"THE AIM OF THE GAME IS TO DOD
GE THE ORANGE SQUARES THAT ARE
   CHARGING TOWARDS YOU.":PRINT
80 PRINT"  USE THE LEFT AND RIGH
T ARROW    KEYS TO AVOID THE SQU
ARES."
90 PRINT:PRINT:PRINT
100 PRINT@384,"1=HARD, 3=EASY"
110 INPUT "SKILL LEVEL (1-3)";SK
:IF SK=1 THEN POKE 65495,0:SK=0
120 IF SK=2 THEN SK=0
130 SK=SK*30
140 CLS
150 'SCATTER ORANGE BOXES (X$)
160 '
170 X=480+RND(32)-1
180 PRINT@X,X$;
190 GOSUB 250
200 'SCROLL SCREEN UP.
210 PRINT@511,""
220 SCORE=SCORE+1
```

```
230 GOSUB 530
240 GOTO 160
250 'KEYBOARD SCAN ROUTINE
260 'IF ARROWS KEYS PRESSED
270 'THEN MOVE MAN.
280 IF PEEK(343)<>255 THEN KK=KK
-1ELSEIF PEEK(344)<>255 THEN KK=
KK+1
290 IF KK<0 THEN KK=31
300 IF KK>31 THEN KK=0
310 'UPDATE MAN'S POSITION
320 PRINT@KK,ME$
330 'CHECK TO SEE IF MAN IS HIT
340 SET(KK*2,2,3)
350 IF POINT(KK*2,4)=8 THEN GOSU
B 370
360 RETURN
370 'YOU HAVE DIED!
380 FOR X=1 TO 72 STEP 8:SOUND X
,2:CLS(X/8)
390 NEXT
400 CLS0
410 FOR X=1 TO127:PRINT"you";CHR
$(128);:NEXTX
420 CLS0
430 FOR X=1 TO102:PRINT"have";CH
R$(128);:NEXT
440 CLS0
450 FOR X=1 TO102:PRINT"died";CH
R$(128);:NEXT
460 CLSRND(9)-1
470 PRINT@66,"YOUR FINAL SCORE W
AS:";SCORE;
480 PRINT@130,"WOULD YOU LIKE TO
 PLAY AGAIN?";
490 PRINT@173,"(Y/N)";
500 PRINT@206,"";:INPUT A$
510 IF LEFT$(A$,1)<>"Y" THEN CLS
:END
520 RUN
530 FOR TIME=1 TO SK:NEXT:RETURN
```

**Utility**

## An Alarming Solution

4K

### By Roderick Clark

Are you working too hard? Need a break from glaring at the CoCo screen all day? If so, the following program may help.

*Alarm* allows you to set a timer to allow for computing breaks. Just input the number of seconds you want to rest and an alarm will sound when it's time to go back to work. Be sure to turn the volume up so you will be able to hear it from a distance.

**The listing:** ALARM

```
1 'ALARM/BAS
2 'SENIC PRODUCTIONS 1987
  RODERICK CLARK
5 CLS
10 FOR RC=1TO12
15 SOUND RND(32),2
20 PRINTTAB(10)">ALARM>"
30 NEXT RC
35 CLS
40 FOR CR=1TO12
50 SOUNDRND(32),2
60 PRINTTAB(10)">FROM>
61 NEXT CR
62 CLS:FOR TC=1TO12:PRINTTAB(5)"
>SENIC PRODUCTIONS>
65 SOUNDRND(32),2
66 NEXT TC
67 PRINT"             1 9 8 7
69 FOR EZ=1TO2300:NEXT EZ:CLS:
70 PRINT           "HOW MANY SEC UN
TIL  THE  ALARM  GOES OFF >>":IN
PUT H
71 FOR YG=1TO460*H
72 NEXT YG
73 CLS:PRINT:PRINT"           A L A
R M
74 SOUND140,8
75 SOUND100,5
76 GOTO 73
```

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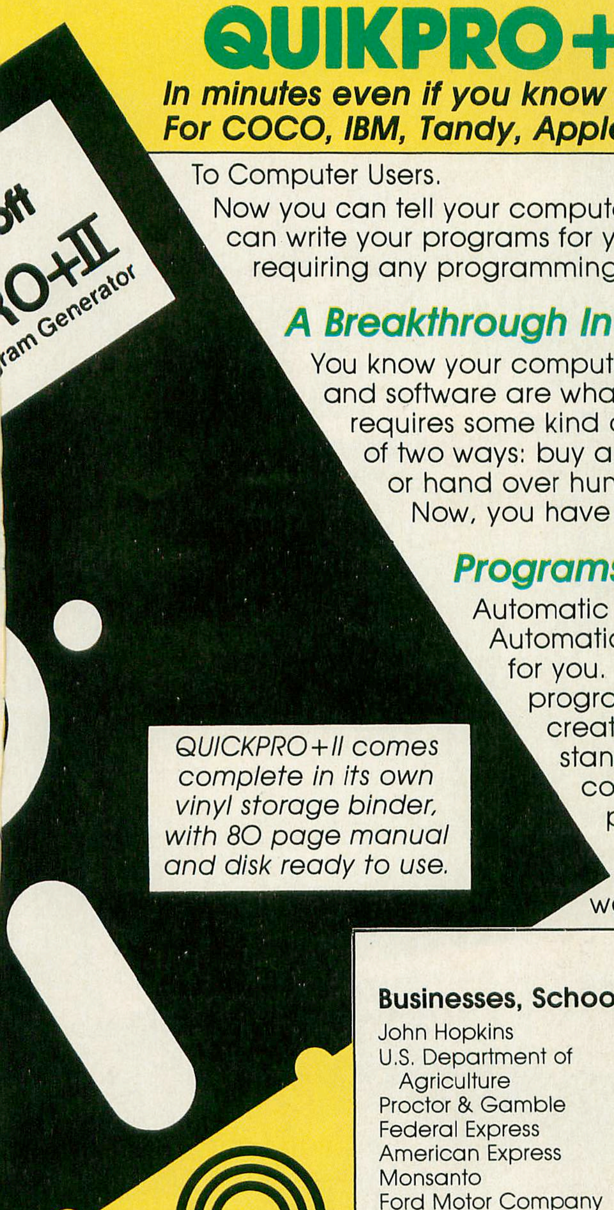

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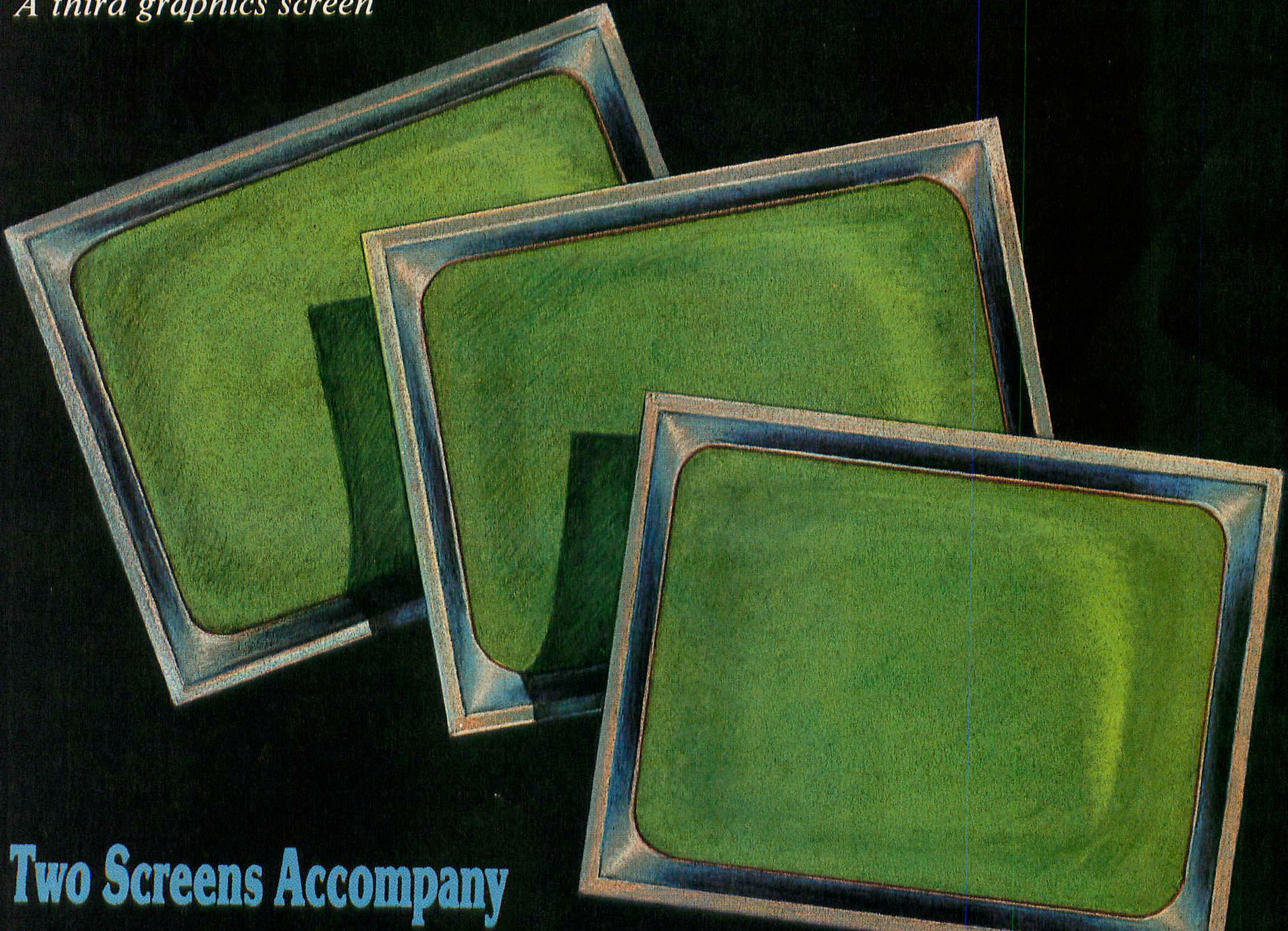
*A third graphics screen*



# Two Screens Accompany But Three is NOT a Crowd

### By Darryl W. Hawkins

CoCo's Extended Color BASIC only allows two `PMODE 3` or `PMODE 4` graphics screens to be loaded into the computer at any one time, and each screen occupies four pages or 6,144 bytes of graphics memory. To switch screens, you would simply use the `PMODE` command. But what if you need three screens?

After digging through books, magazines and untold bits of information, I came up with the solution. Type `PEEK (186) * 256 + PEEK *187)`.

This simple string of commands will return the start address of a high resolution screen. By simply reversing the process, I found I could tell the computer to look elsewhere, outside the reserved graphics memory area, for a graphics screen.

The area I chose to store the third screen I needed was in the unused 8K portion of high RAM, located above Color and Disk BASIC. This unused 8,000 or so bytes of memory was the perfect place to store a 6,144-byte graphics screen and still not take away any memory reserved for my program.

The program `DEMO` shows how three graphics screens can be created, stored in a binary format, reloaded and displayed at any time. The program is written to run on tape or disk; however, you'll need a 64K CoCo with Extended Color BASIC. Before running the program, type in `PCLEAR 8`. No line number is needed.

In order to use the 8K of unused memory, the computer must be switched to the all-RAM mode. Lines 150 through 220 of the program will make this switch for you. These lines simply load in a machine language program that, when executed by Line 220, reads out the data in the ROM chips and writes it into the RAM chips.

---

*Darryl Hawkins has been working with computers since 1970. His hobbies include creating educational programs for his children and fishing. He recently sold his first program to Sugar Software and is currently working on his first book for the CoCo.*

Three graphics words are created in lines 230 through 250 and stored as strings for incorporation into the first graphics screen to be created later.

Line 260 may be of special interest. When the memory location 49152 is `PEEK`ed into, it will return the value 68 if Disk BASIC is present in the system; if not, another value will be returned. This simple little command governs how the rest of the program will operate and thus becomes one of the most important commands used in the program. Since the computer uses different memory areas for storing graphics, depending on which system is present, tape or disk, the computer must know which system to work with.

Lines 270 through 560 create three graphics screens and store each screen, to tape or disk, in a binary format. Note lines 390, 470 and 550. The data for a high resolution screen is stored between memory locations 3584 and 9727, when Disk BASIC is being used. This represents the first four graphics pages of Disk BASIC. When tape is being used, these four pages are located between memory locations 1536 and 9727. Lines 400, 480 and 560 make use of this and store the screens to tape.

Once the screens are stored on tape or disk, they are then reloaded back into the computer. Lines 640 through 690 accomplish this for you. Note how the screens are loaded. Lines 640 and 650 simply load in the first screen. Line 640 does so from disk. Line 650 from tape. After the first screen has loaded, the first graphics pages will be occupied. The second screen, therefore, must be loaded into pages 5 through 8. To do this, an offset must be used. Since each screen represents 6,144 bytes of memory, an offset of 6,144 is used. Lines 660 and 670 use the offset to load the second screen into the higher pages.

Loading the third screen is a little different. We now have to tell the computer to load the third screen outside the normal graphics screen memory area. Since tape and disk use two different memory areas for storing graphics, we have to provide two different offsets — provided, of course, the screen is to be stored in the same location. Remember, the screen was originally saved using two different starting points, depending on which system was used. I chose memory location 57856 to store the third screen. When using disk, the offset needed to load the screen starting at this address would be: 57856 - 3584 = 54272. For tape, it would be 57856 - 1536 = 56320. This starts the third screen on an even 256-byte page of memory. Screens 1 and 2 also start on an even 256-byte page, thus all screens start the same.

Lines 770 through 840 make use of the starting page for each screen. These lines will display each screen for a short period. Note Line 810. It sets the screen pointer for the third screen, tape or disk. `POKE 186, 226` actually tells the computer to look to memory location (226 * 256) = 57856 for the start of screen three. Since each screen starts on an even 256-byte page and memory location 187 already contains 0 for its value, there is no need to poke this address for any of the screens.

I hope this article and the graphics demo program open new doors for your imagination.

---

*(Questions about this program may be addressed to the author at P.O. Box 3134, Gulfport, MS 39505. Please enclose an SASE for a written reply.)* ☐

```
220 .......79
330 ......133
480 .......70
670 ......126
END ......10
```

**The listing:** DEMO

```
1 '
        LISTING 1
2 '
3 '
10 '      GRAPHIC DEMO
20 '    COPYRIGHT 1986
30 '          BY
40 '    DARRYL W HAWKINS
50 '      P.O.BOX 3134
60 '   GULFPORT, MS 39505
70 'TELEPHONE (601) 832-8236
80 '
90 '
100 '    ENTER PCLEAR8 BEFORE
110 '    RUNNING PROGRAM
120 '
130 PCLEAR8:PMODE4,1
140 CLS:PCLS:CLEAR1000
145 '    RAM SWITCH
150 DATA 26,80,190,128,0,183,255
,222,166,128
160 DATA 183,255,223,167,31,140,
224,0,37,241,57
170 FORI=1TO21
180 READA
190 B$=B$+CHR$(A)
200 NEXTI
210 A=VARPTR(B$)+1
220 POKEA,126:EXECA
225 '     HI-RES GRAPHIC WORDS
230 G$="BM76,80C0;R5D5G2L8H2U11E
2R7F2BR9ND13U2R9F2D4G2L5NL3F7BR9
U7NR11U4E4R3F4D11BR9U7NU8R9E2U4H
2NL8BR11D8ND7R11NU8D7BR9U15BR11N
R7G2D11F2R7E2BU11H2"
240 S$="BM84,100C0;H2L8G2D3F2BD8
NH2R7E2U4H2NL6BR23BU5H2L7G2D11F2
R7NE2BR11U15R9F2D4G2L5NL3F7BR9NR
11U7NR7U8R11BR9NR11D8NR7D7R11BR9
U15R1F1D1F1D1F1D1F1D1F1D1F1D1F1D
1F1R1U15"
250 N1$="BM112,140C0;E2U11H2L6G2
D11F2R7BR11U15R1F1D1F1D1F1D1F1D1
F1D1F1D1F1D1F1R1U15BR9NR11D8NR7D
7R11"
255 '     DISK OR TAPE CHECK
260 X=PEEK(49152)
270 IFX=68THEN310
280 PRINT@166,"READY TAPE FOR RE
CORD"
290 PRINT@198,"PRESS ANY KEY"
300 IFINKEY$=""THEN300
305 '     GRAPHIC SCREEN1
```

```
310 SCREEN1,1
320 FORI=0TO192STEP2:LINE(0,96)-
(255,I),PSET:NEXTI
330 FORI=0TO192STEP2:LINE(255,96
)-(0,I),PSET:NEXTI
340 FORI=0TO255STEP2:LINE(128,0)
-(I,192),PSET:NEXTI
350 FORI=0TO255STEP2:LINE(128,19
2)-(I,0),PSET:NEXTI
360 DRAWG$
370 DRAWS$
380 DRAWN1$
385 '     SAVE SCREEN 1
390 IFX=68THENSAVEM"SCREEN1",358
4,9727,3584:GOTO410
400 CSAVEM"SCREEN1",1536,7679,15
36
405 '     GRAPHIC SCREEN 2
410 PMODE3,1:PCLS1:SCREEN1,1
420 FORI=0TO192STEP8:LINE(128,96
)-(0,I),PSET:NEXTI
430 FORI=0TO255STEP16:LINE(128,9
6)-(I,192),PSET:NEXTI
440 FORI=192TO0STEP-8:LINE(128,9
6)-(255,I),PSET:NEXTI
450 FORI=256TO0STEP-16:LINE(128,
96)-(I,0),PSET:NEXTI
460 PMODE4,1:SCREEN1,1
465 '     SAVE SCREEN 2
470 IFX=68THENSAVEM"SCREEN2",358
4,9727,3584:GOTO490
480 CSAVEM"SCREEN2",1536,7679,15
36
485 '     GRAPHIC SCREEN 3
490 PMODE3,1:PCLS:SCREEN1,1
500 FORI=1TO100
510 A=RND(255):B=RND(192):C=RND(
4)
520 CIRCLE(A,B),C
530 NEXTI
540 PMODE4,1:SCREEN1,1
545 '     SAVE SCREEN 3
550 IFX=68THENSAVEM"SCREEN3",358
4,9727,3584:GOTO570
560 CSAVEM"SCREEN3",1536,7679,15
36
570 PCLS
575 '     DISK OR TAPE CHECK
580 IFX=68THEN640
590 CLS:SCREEN0
600 PRINT@168,"REWIND TAPE"
610 PRINT@200,"PRESS PLAY"
620 PRINT@232,"PRESS ANY KEY"
630 IFINKEY$=""THEN630
635 '     RELOAD SCREENS
640 IFX=68THENLOADM"SCREEN1":GOT
O660
650 CLOADM"SCREEN1"
660 IFX=68THENLOADM"SCREEN2",614
4:GOTO680
670 CLOADM"SCREEN2",6144
680 IFX=68THENLOADM"SCREEN3",542
72:GOTO700
690 CLOADM"SCREEN3",56320
695 '     USER PROMPT
700 CLS
710 SCREEN0
720 PRINT@162,"PRESS <S> TO SWIT
CH SCREENS"
730 K$=INKEY$
740 IFK$=""THEN730
750 IFK$="S"THEN770
760 GOTO730
765 '     SCREEN SWITCH
770 SCREEN1
780 FORI=1TO500:NEXTI
790 IFX=68THENPOKE186,38ELSEPOKE
186,30
800 SCREEN1:FORI=1TO500:NEXTI
810 POKE186,226
820 SCREEN1:FORI=1TO500:NEXTI
830 IFX=68THENPOKE186,14ELSEPOKE
186,6
840 GOTO700
```

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# Making Dumb Terminal Programs Smart

## By Marty Goodman
## Rainbow Contributing Editor

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*Michael D. Fischer*
*(MMIKE88)*
*Long Island, NY*

VT-52 is one of many different *protocols* that give an otherwise "dumb" terminal program or device some degree of "smarts." These protocols allow a host computer to have rapid and precise control over the position of the cursor on the screen, and to selectively erase part of a line or part of the screen. This capability (which is far better supported by the VT-100 and VT-220 protocols) allows one to write sophisticated and pleasing full-screen editors that can run remotely on one's terminal screen. This is just one desirable aspect of the use of such protocols. Most CoCo users have little use for them, but some professionals who deal with mainframe computers find support for VT-52, VT-100 and the like to be essential. Under Disk Extended Color BASIC, Cer Comp's Data Pak II Plus (when used with a PBJ 80-column card) and Data Pak 3 Plus on the CoCo 3 provide what I have been told is excellent support for much of the VT-100 protocol.

### Detecting the Baud

*How can I detect the baud rate at which data is entering the RS-232 pack?*

*John Ruhnow*
*(RUHNOW)*
*Duncanville, TX*

There is no simple means of determining the baud rate of incoming data to the RS-232 pack. Only in a situation where you know what the data is beforehand can you perform such a test. That is, *if* the pack is talking to a host system whose responses are known, you can arrange your program to send data to that host at differing baud rates until you get back the response you are looking for. At that point, you merely note what baud rate you were using at the time.

The letter A is commonly tested for, as Roger Bouchard pointed out in his response to your question on Delphi, because it has the bit pattern 1000001. Note that in logging onto Tymnet at 1200 baud you must first type in the letter A after Tymnet's node sends you gibberish. Tymnet looks for an A at 1200 baud, and if it sees one it knows you are running at 1200 baud. But it can do this *only* because it *knows* you are going to type an A at 1200 baud if you happen to have 1200 baud capability.

If you plan on writing any software for the "deluxe" RS-232 pack, it is important that you have complete documentation on the 6551 UART chip in that pack. Tandy's manual is rather incomplete. In a "CoCo Consultations" column some months back, I provided the information that Tandy forgot to include in their manual. We also have on Delphi in the Hardware Hacking section of our database an excellent file that gives all the information on the registers of the 6551 chip that is missing from the RS-232 pack manual. Alternatively, you can get this information by writing either of the two manufacturers of the chip (Synertec and AMI) for data sheets that will make clear that the chip is unable to directly detect what baud rate data it is encountering.

### Assembly Equivalents

*What are the equivalents of* `PEEK(J)` *and* `POKE` *J, K in 6809 assembly language?*

*John Friedrich*
*Natrona Heights, PA*

Assuming J is an integer between 0 and $FFFF Hex (65535 decimal), and that K is an integer between 0 and $FF (255 decimal), then the equivalents would be `LDA J` for `PEEK(J)` and `LDA #K` followed by `STA J` for `POKE J,K`. These statements place the contents of memory location J into the A register, or put the value K into the A register, then store that value to location J (respectively). I recommend an elementary book on 6809 assembly language programming. Sybex publishes an excellent one, titled *Programming the 6809*, by Zaks and Labiak.

### Integrating Drives

*I have one of the white-cased, full-height Radio Shack disk drives. I am considering buying a new Radio Shack FD 501 drive system. How can I use the*

---

*Martin H. Goodman, M.D., a physician trained in anesthesiology, is a longtime electronics tinkerer and outspoken commentator — sort of the Howard Cosell of the CoCo world. On Delphi, Marty is the SIGop of* RAINBOW*'s CoCo SIG and database manager of OS-9 Online. His non-computer passions include running, mountaineering and outdoor photography. Marty lives in San Pablo, California.*

*old full-height drive with the FD 501? I suspect I may need to add a Catalog No. 26-1564 connector to the FD 501 cable. Is there anything else I must do?*

*John D. Cleveland*
*Luneburg, Nova Scotia*

You will either have to make up a new cable for the FD 501 system or crimp on an extra connector to it. The Radio Shack Catalog No. 26-1564 is indeed the type of connector you need to use. However, you also have to pull some teeth from that connector before crimping it to the FD 501 cable. The teeth for pins 10, 12, 14 and 32 are used, respectively, to carry drive select signals for drives 0, 1, 2 and 3. You must pull out all three teeth that correspond to the drive numbers you *don't* want the old full-height drive to be. Was that full-height drive formerly designed to be Drive 0? If so, you will probably have to open the case, look for the terminator resistor and remove it from the drive. You see, your FD 501 system will likely also have a terminator resistor inside it, and there must be only one terminator resistor per drive system. On the old full-height drives, the terminator resistor will be a single in-line pin, coated with yellow epoxy resin, sitting in a little single in-line pin socket. Sometimes such terminator resistors are in dual in-line pin cases that look just like integrated circuits. Because Tandy has changed models of disk drives so often, it may be necessary for you to consult a local tinkerer for help with this project. You should consider getting a drive from one of the advertisers in RAINBOW. These often present a better value, and often the supplier is available to provide more knowledgeable technical help than can most Radio Shack retail store employees.

### Monochrome Help

*I want to modify my CoCo 2 to drive a TTL monochrome monitor. Can you tell me how to do this?*

*Dean Lawrence*
*(DEANL)*
*Wichita Falls, TX*

Your question presents several problems. First of all, I do not recommend attempting to do what you ask. With composite monochrome monitors selling for $30 used, and as little as $70 new, it usually will not pay to spend the time and money needed to design the more complicated interfaces for other sorts of monitors. There are several different types of TTL monochrome monitors. The "separate sync" monitors used by the Kaypro, Model 3, Model 4 and Osborne computers can be relatively easy to adapt for use with the CoCo. These use separate horizontal and vertical sync lines, a standard type of luminance input and have a "normal" horizontal scan rate of 15.75 kHz. To hook a CoCo to these, all you need is a monochrome monitor driver circuit combined with a sync separator circuit. Each of these types of circuits can be whipped up using two or three transistors by anyone familiar with the workings of analog video. Incompetent engineers will attempt sync separation using a dedicated integrated circuit.

However, the IBM PC "Monographics type" (also known as "Hercules type") TTL monochrome monitor uses TTL levels on its video luminance signal. Worse yet, these monitors use a different horizontal scan rate of 18.432 kHz. Adapting them for the CoCo is rather difficult, and it is virtually impossible to use all of their screen. The only adapter I have ever seen for them produces an image that uses up about the center two-thirds of the screen. Their device was designed to hook into the RGB video port of a CoCo 3. To use it with a CoCo 1 or 2, you'd have to add a monochrome monitor driver and sync separator in front of their gizmo.

There are other monochrome monitor protocols floating around, including the one used by the Macintosh and various dedicated Hi-Res display systems. These are essentially impossible to interface to the CoCo. In summary, it is difficult to hook such TTL monochrome monitors to the CoCo. You must be an experienced video hacker to attempt it.

### A Different Pinout

*I tried to help a friend hook the CoCo's 4-pin DIN serial port to an IBM PC and to a Model 100 using some instructions given by Dr. ASCII in an issue of RAINBOW. The cable described there would not work. Can you help me?*

*David Seibold*
*Bakersfield, CA*

The pinout given by Dr. ASCII was incorrect and will not work. To make a proper null modem cable interface a CoCo to an IBM PC or to a Model 100, connect a CoCo-type, four-pin DIN male connector to an IBM PC or Model 100 type DB 25 connector as follows:

On the DB 25 connector, jumper Pin 4 to Pin 5. Jumper pins 6, 8 and 20 together. Hook Pin 2 of the DB 25 to Pin 2 of the CoCo four-pin DIN connector. Hook Pin 3 of the DB 25 to Pin 4 of the CoCo four-pin DIN connector. Hook Pin 7 of the DB 25 to Pin 3 of the CoCo four-pin DIN connector. Hook pins 6, 8 and 20 (which you just shorted to each other) of the DB 25 connector to Pin 1 of the CoCo four-pin DIN connector.

I've used a cable like this for data transfer up through 9600 baud between my CoCo and IBM PC XT clone and between my CoCo and my Model 100, and it works perfectly.

### Amiga 1000 Monitor

*How can I hook a Radio Shack CM8 to an Amiga 1000?*

*Greg Miller*
*(GREGMILLER)*
*Grand Ledge, MI*

You need to invert the sync signals coming out of the Amiga's separate sync RGB analog output connector. Run the H and V sync signals through a 74LS04 inverter buffer. With the sync signals inverted, the CM8 will accept the RGB analog type signal from the Amiga. However, the mediocre resolution of the CM8 might not give a very pleasing image when used with the high resolution screens of the Amiga. Note also that you can use an Amiga 1080 monitor with a CoCo 3 provided you combine and invert the CoCo 3's sync signals in much the same way as I described in my August 1987 article on RGB monitors, which explained how to hook the CoCo 3 to a Sony KV1311CR.

**Your technical questions are welcomed. Please address them to CoCo Consultations, THE RAINBOW, P.O. Box 385, Prospect, KY 40059.**

**We reserve the right to publish only questions of general interest and to edit for brevity and clarity. Due to the large volume of mail we receive, we are unable to answer letters individually.**

**Questions can also be sent to Marty through the Delphi CoCo SIG. From the CoCo SIG> prompt, pick Rainbow Magazine Services, then, at the RAINBOW> prompt, type `ASK` (for Ask the Experts) to arrive at the EXPERTS> prompt, where you can select the "CoCo Consultations" online form which has complete instructions.**

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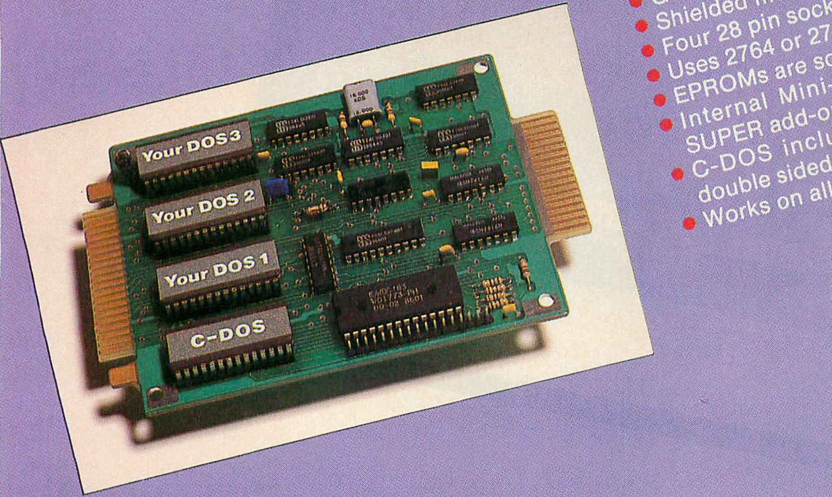

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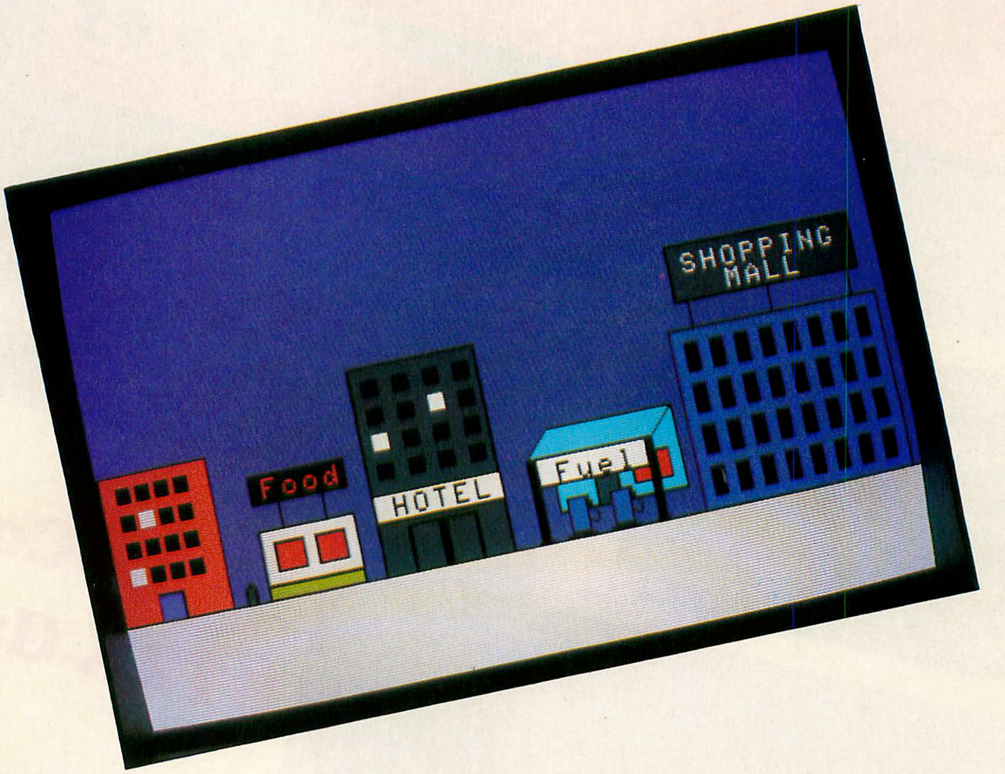


# A Short Day's Journey into Night

## By Greg Hall

I got the idea for *City Sun* from a Steve Bjork commentary. He said the CoCo 3 could, by changing a few color registers, make a scene of New York City in the day slowly change to one at dusk, and finally to one at night, with stars and the whole bit.

That's exactly what I did. The program uses the Hi-Res features found in the CoCo 3 to draw a city scene of five buildings: a regular building, a restaurant, a hotel, a gas station, and even a fire hydrant to fill in a space between a couple of the buildings.

Slowly, the sky makes 15 different color changes through the "day," with a bit of motion in each one to make the program a little more exciting. Pressing BREAK at any time stops the execution of the program.

*(Questions or comments may be addressed to the author at 3251 21st Ave., Columbus, NE 68601. Please enclose an SASE when requesting a reply.)* ☐

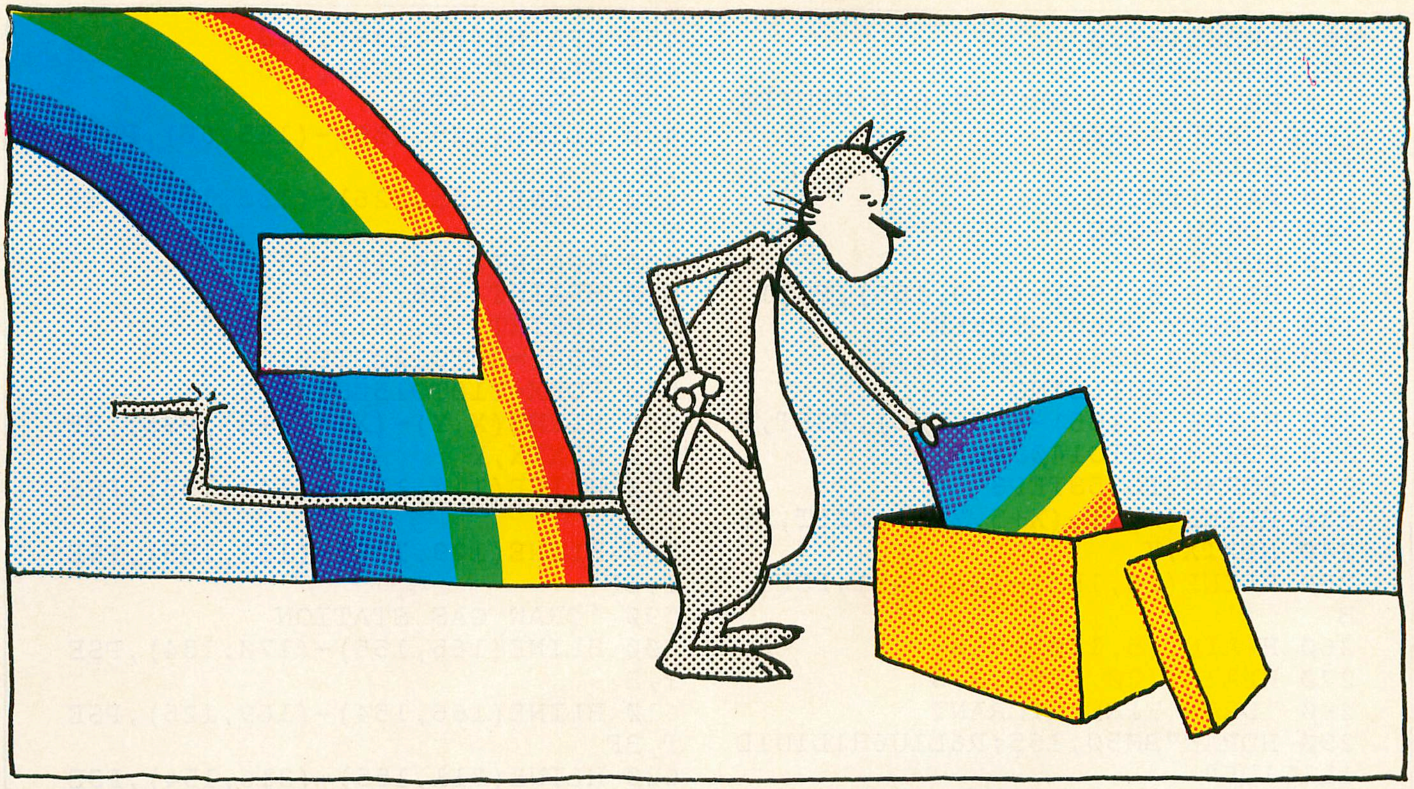
---

*Greg Hall is a 13-year-old CoCo 3 programmer who lives in Columbus, Nebraska. He also enjoys playing golf and building electronic projects.*

| | | | |
|---|---|---|---|
| 300 | 144 | 1720 | 185 |
| 500 | 121 | 1980 | 196 |
| 700 | 243 | 2270 | 44 |
| 930 | 203 | 2470 | 85 |
| 1210 | 88 | END | 229 |
| 1480 | 213 | | |

**The listing:** CITY SUN

```
10 '============================
20 '   CITY SUN TO DEMONSTRATE
30 '    THE USE OF THE HI-RES
40 '        PALETTE COMMAND
50 '============================
60 '
70 ONBRKGOTO2670
80 ONERRGOTO2640
```



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```
90 POKE65497,0
100 HSCREEN2
110 HBUFF1,600:HBUFF2,600:HBUFF3
,600:HBUFF4,600
120 HCLS4
130 PALETTECMP
140 'DRAW ROAD
150 HCOLOR8
160 HLINE(0,155)-(319,155),PSET
170 'EMPTY ROAD BUFFER
180 HGET(0,155)-(30,191),1
190 'DRAW BUILDING
200 HLINE(0,155)-(45,100),PSET,B
210 FORY=105TO140STEP10
220 FORX=7TO35STEP8
230 HLINE(X,Y)-(X+5,Y+5),PSET,BF
240 NEXTX,Y
250 HLINE(16,155)-(26,145),PSET,
B
260 HPAINT(5,150),7,8
270 HPAINT(20,150),2,8
280 'DRAW FIRE HYDRANT
290 HDRAW"BM50,155;R6L1U6H1L1U1D
1L1G1D6"
300 HPAINT(52,152),3,8
310 'DRAW RESTAURANT
320 HCOLOR8
330 HLINE(60,155)-(97,130),PSET,
B
340 HLINE(70,130)-(70,120),PSET
350 HLINE(87,130)-(87,120),PSET
360 HLINE(60,110)-(97,120),PSET,
B
370 HPAINT(62,112),,8
380 HCOLOR1
390 HPRINT(8,14),"Food"
400 HCOLOR8
410 HLINE(60,150)-(97,150),PSET
420 HPAINT(61,151),0,8
430 HLINE(65,135)-(76,145),PSET,
B
440 HLINE(81,135)-(92,145),PSET,
B
450 HPAINT(66,138),1,8
460 HPAINT(82,136),1,8
470 'DRAW HOTEL
480 HLINE(105,155)-(155,80),PSET
,B
490 HLINE(105,126)-(155,136),PSE
T,B
500 HPAINT(106,154),3,8
510 HPAINT(106,125),3,8
520 HPRINT(14,16),"HOTEL"
530 FORY=85TO120STEP10
540 FORX=110TO150STEP12
550 HLINE(X,Y)-(X+5,Y+5),PSET,BF
560 NEXTX,Y
570 HLINE(117,138)-(143,155),PSE
T,B
580 HLINE(129,138)-(131,155),PSE
T,BF
590 'DRAW GAS STATION
600 HLINE(165,155)-(170,154),PSE
T,B
610 HLINE(166,154)-(169,125),PSE
T,BF
620 HLINE(211,155)-(216,154),PSE
T,B
630 HLINE(212,154)-(215,125),PSE
T,BF
640 HLINE(176,155)-(187,154),PSE
T,B
650 HLINE(178,153)-(185,141),PSE
T,B
660 HDRAW"BM186,149;F1R1E1U2H3R1
U1L1U2"
670 HPAINT(179,152),2,8
680 HLINE(193,155)-(204,154),PSE
T,B
690 HLINE(195,153)-(202,141),PSE
T,B
700 HDRAW"BM203,149;F1R1E1U2H3R1
U1L1U2"
710 HPAINT(196,152),2,8
720 HDRAW"BM166,125;R49E10L49G10
D10R49U10E10D30L22U4L4U6L9D10R4L
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4L4U4L8D4L3U10R30D5R15U10L5"
730 HPRINT(22,16),"Fuel"
740 HPAINT(180,140),5,8
750 HPAINT(200,140),5,8
760 HPAINT(220,144),5,8
770 HPAINT(176,124),5,8
780 HPAINT(219,135),1,8
790 HPAINT(206,136),1,8
800 HPAINT(195,136),3,8
810 'DRAW SHOPPING MALL
820 HLINE(230,155)-(315,90),PSET
,B
830 FORY=95TO145STEP15
840 FORX=235TO305STEP10
850 HLINE(X,Y)-(X+5,Y+10),PSET,B
F
860 NEXTX,Y
870 HCOLOR8
880 HPAINT(231,154),2,8
890 HLINE(235,80)-(310,60),PSET,
B
900 HPAINT(236,79),3,8
910 HCOLOR4
920 HPRINT(30,8),"SHOPPING"
930 HPRINT(32,9),"MALL"
940 HCOLOR8
950 HLINE(240,90)-(240,80),PSET
960 HLINE(272,90)-(272,80),PSET
970 HLINE(305,90)-(305,80),PSET
980 'SET BACKGROUND FOR SKY
990 HCOLOR10
1000 HPAINT(0,0),,8
1010 HPAINT(75,125),,8
1020 HPAINT(170,146),,8
1030 HPAINT(186,146),,8
1040 HPAINT(193,146),,8
1050 HPAINT(203,146),,8
1060 HPAINT(210,146),,8
1070 HPAINT(241,89),,8
1080 HPAINT(273,89),,8
1090 'PEOPLE WAKE UP-LIGHTS ON
1100 GOSUB2240
1110 FORX=1TO5
1120 X1=(RND(4)*8)-1:Y1=(RND(4)*
10)+95:X2=(RND(4)*12)+98:Y2=(RND
(4)*10)+75
1130 HPAINT(X1,Y1),4,7
1140 FORI=1TO1000:NEXTI
1150 HPAINT(X2,Y2),4,3
1160 FORI=1TO1000:NEXTI
1170 NEXTX
1180 'RED CAR GOES BY
1190 GOSUB2240:C=3:GOSUB2130:GOS
UB2340
1200 'SHOPPING MALL OPENS
1210 GOSUB2240
```

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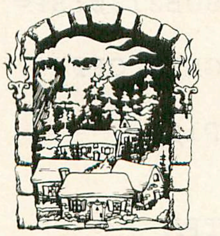

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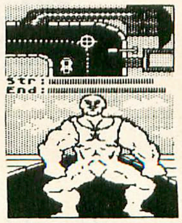

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```
1220 FORY=95TO145STEP15
1230 FORX=235TO305STEP10
1240 IFY=95THENHS=9
1250 IFY=110THENHS=11
1260 IFY=125THENHS=12
1270 IFY=140THENHS=13
1280 PALETTEHS,0
1290 HCOLORHS
1300 HPAINT(X,Y),,2
1310 NEXTX,Y
1320 FORI=9TO13
1330 IFI=10THENNEXTI
1340 PALETTEI,63
1350 FORX=1TO2000:NEXTX,I
1360 'BIRDS FLY BY
1370 GOSUB2240
1380 POKE65496,0
1390 HCOLOR8
1400 HDRAW"BM300,13;R4L1U1D2BM30
0,17;R4L1U1D2BM308,15;R4L1U1D2"
1410 GOSUB2570
1420 POKE65497,0
1430 'GREEN CAR GOES BY
1440 GOSUB2240:C=0:GOSUB2130:GOS
UB2340
1450 'AIRPLANE FLYS ACROSS
1460 GOSUB2240
1470 HCOLOR4
1480 HDRAW"BM309,15;R2E3G3F3H3R6
"
1490 GOSUB2570
1500 'ORANGE CAR GOES BY
1510 GOSUB2240:C=7:GOSUB2130:GOS
UB2340
1520 'CLOUD PASSES OVER
1530 GOSUB2240
1540 POKE65496,0
1550 HDRAW"BM292,6;C4R3E2F5D1R2E
3R5D2F3R2D1G5D1L25H4U3L2U1H3E7R3
F4D1"
1560 HPAINT(295,10),4,4
1570 GOSUB2570
1580 POKE65497,0
1590 'COP WITH FLASHING LIGHT
1600 GOSUB2240:C=4:GOSUB2130:SP=
1:GOSUB2340:SP=0:HCOLOR8
1610 'PICKUP TRUCK GOES BY
1620 GOSUB2240
1630 HDRAW"BM289,166;R3U5D5R12U5
D5R13U5L13U4L8G4R12L12L3D5"
1640 HPAINT(290,162),2,8
1650 HPAINT(293,162),2,8
1660 HPAINT(305,162),2,8
1670 HCIRCLE(293,165),3,8
1680 HPAINT(293,165),8,8
1690 HCIRCLE(311,165),3,8
1700 HPAINT(311,165),8,8
1710 GOSUB2500
1720 'MAGENTA CAR GOES BY
1730 GOSUB2240:C=6:GOSUB2130:GOS
UB2340
1740 'SHOPPING MALL CLOSES
1750 GOSUB2240
1760 FORI=13TO9STEP-1
1770 IFI=10THENNEXTI
1780 PALETTEI,0
1790 FORX=1TO2000:NEXTX,I
1800 FORY=95TO145STEP15
1810 FORX=235TO305STEP10
1820 HPAINT(X,Y),8,2
1830 NEXTX,Y
1840 'TAXI GOES BY
1850 GOSUB2240:C=1:GOSUB2130:SP=
2:GOSUB2340:SP=0
1860 'PEOPLE SLEEP-LIGHTS OFF
1870 GOSUB2240
1880 FORY=105TO140STEP10
1890 FORX=7TO35STEP8
1900 HPAINT(X,Y),,7
1910 FORPA=1TO500:NEXTPA
1920 NEXTX,Y
1930 FORY=85TO120STEP10
1940 FORX=110TO150STEP12
1950 HPAINT(X,Y),,3
1960 FORPA=1TO500:NEXTPA
1970 NEXTX,Y
1980 'STARS
```

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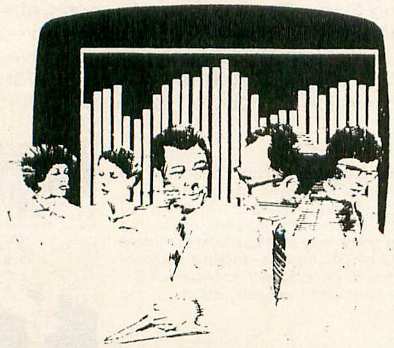

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```
1990 GOSUB2240
2000 FORI=9TO15
2010 PALETTEI,0
2020 NEXTI
2030 FORI=1TO100
2040 A=RND(320)-1:B=RND(130)-1:C
=RND(7)+8
2050 IFHPOINT(A,B)<9THEN2040
2060 HSET(A,B,C)
2070 NEXTI
2080 FORI=9TO15
2090 IFI=10THENNEXT
2100 PALETTEI,(RND(2)-1)*63
2110 NEXTI
2120 GOTO2080
2130 'DRAW CAR
2140 HDRAW"BM4,184;C8R4U4D4R8U4D
4R7U4D4R5U2L1U2L5H4L3D4R7L7U4L5G
3D1R8L8L4D4"
2150 HPAINT(6,182),C,8
2160 HPAINT(15,182),C,8
2170 HPAINT(20,182),C,8
2180 HPAINT(25,182),C,8
2190 HCIRCLE(9,186),3,8
2200 HPAINT(9,186),8,8
2210 HCIRCLE(22,186),3,8
2220 HPAINT(22,186),8,8
2230 RETURN
2240 'CHANGE SKY & BUFFER COLOR
2250 READC
2260 IFC=-1THENREADC:GOTO2280
2270 FORI=1TO2000:NEXT
2280 PALETTE10,C
2290 HGET(279,0)-(319,20),2
2300 FORI=1TO2000:NEXT
2310 RETURN
2320 'SKY COLOR DATA
2330 DATA-1,14,13,12,29,28,45,44
,45,28,29,12,13,14,16,0
2340 'GET/PUT ROAD MOVEMENT L-R
2350 IFSP=0THEN2410ELSEIFSP=1THE
N2360ELSEIFSP=2THEN2400
2360 PALETTE14,7
2370 HCOLOR14
2380 HLINE(13,173)-(15,175),PSET
,BF
2390 PA=7:GOTO2410
2400 HLINE(10,173)-(18,175),PSET
,BF
2410 HGET(0,155)-(30,191),3
2420 FORX=0TO289
2430 IFSP=0ORSP=2THEN2460ELSEBL=
BL+1
2440 IFBL=5ANDPA=63THENBL=0:PA=7
:PALETTE14,7
2450 IFBL=5ANDPA=7THENBL=0:PA=63
:PALETTE14,63
2460 HPUT(X,155)-(X+30,191),3,PS
ET
2470 NEXTX
2480 HPUT(X-1,155)-(X+30-1,191),
1,PSET
2490 RETURN
2500 'GET/PUT ROAD MOVEMENT R-L
2510 HGET(289,155)-(319,191),3
2520 FORX=289TO0STEP-1
2530 HPUT(X,155)-(X+30,191),3,PS
ET
2540 NEXTX
2550 HPUT(X+1,155)-(X+30+1,191),
1,PSET
2560 RETURN
2570 'GET/PUT SKY MOVEMENT R-L
2580 HGET(279,0)-(319,20),4
2590 FORX=279TO0STEP-1
2600 HPUT(X,0)-(X+40,20),4,PSET
2610 NEXTX
2620 HPUT(X+1,0)-(X+40+1,20),2,P
SET
2630 RETURN
2640 'PRINT ERROR NUMBER & LINE
2650 CLS
2660 PRINT"ERROR NUMBER";ERNO;"I
N LINE";ERLIN
2670 'RESTORE PALETTE & SPEED
2680 POKE65496,0
2690 PALETTECMP
```

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# CoCo Cathead — 20 Seconds into the Future

## By Fred B. Scerbo
## Rainbow Contributing Editor

*Editor's Note: If you have an idea for the "Wishing Well," submit it to Fred c/o THE RAINBOW. Remember, keep your ideas specific, and don't forget this is BASIC. All programs resulting from your wishes are for your use, but remain the property of the author.*

Much of the mail I have received in recent months has been very encouraging. Many of you told me that you enjoy the new educational programs I have introduced in these pages, such as last month's *Conjugate Instructor.* Still others have requested a return to some graphics just for the fun of it. One thing many of you (too many to mention by name) have asked for is more programs for the Tandy Speech-Sound Pak.

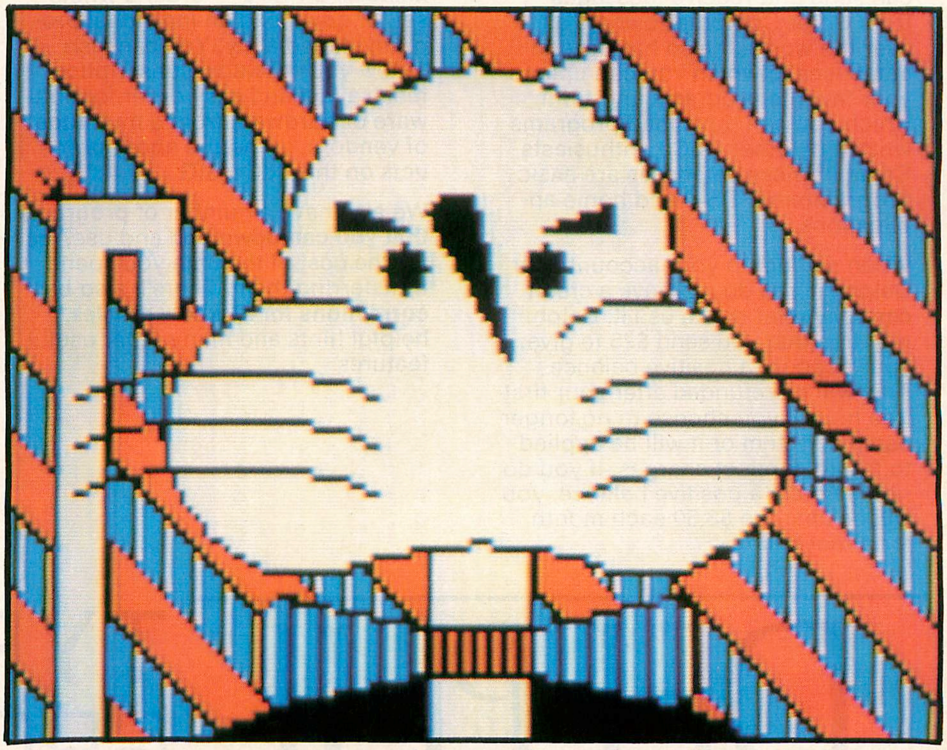
Therefore, this month's project is a talking graphics program, just for the fun of it! Fear not, those of you who do not have the speech pak — this program displays a fun graphic, even without speech.

**A Talking CoCo Cat?**

You probably have seen ads for talking head programs that work with different speech packs or programs. The idea is to give your computer a face to match its voice. I have long wanted to make a BASIC program do that, but I didn't know what to use for a face. I even toyed with the idea of making a robot or a talking keyboard face. These ideas just didn't seem to strike a proper chord.

One day while I was trying to decide what soft drink to choose, a familiar face intruded on my TV screen, a stuttering head superimposed on a background of flashing stripes. I suppose there are not many people who have been able to shelter themselves from the media onslaught of computer creation Max Headroom; his face seems to be everywhere lately. *Doonesbury* cartoonist Gary Trudeau has even created a Ron Reagan clone of Max named Ron Headrest.

That's when I got the idea of giving our CoCo Cat a computer alter ego. This would be a face familiar to every CoCo owner. It wouldn't scare the kids, and best of all, it would be easy to animate. Actually, that's one of the main reasons I chose CoCo Cat. I have


Animation techniques, as well as speech routines for the Speech/Sound Cartridge, allow CoCo Cat to take on a Max Headroom-like appearance.

---

*Fred Scerbo is a special needs instructor for the North Adams Public Schools in North Adams, Massachusetts. He holds a master's in education and has published some of the first software available for the Color Computer through his software firm, Illustrated Memory Banks.*

# WE'RE BRINGING THE COCO

## RAINBOW'S BROADENING ITS SPECTRUM

THE RAINBOW and the Delphi Information Utility have joined together to allow CoCo owners all over the world to connect with one another!

Delphi is a full-service information utility. It offers everything from up-to-the-minute news stories from The Associated Press to electronic mail services. But, *best of all*, it now has **a special forum for Color Computer owners, and it's operated by the people who bring you THE RAINBOW each month.**

The CoCo Special Interest Group (SIG) features a variety of services, including an open forum where you can send and receive messages from Color Computer owners all over the world. It also has several databases to which you can upload your favorite programs and from which you can download programs written by other CoCo enthusiasts. Some of these databases are BASIC programming, OS-9 and home applications.

When setting up your account with Delphi, if you do not have a credit card or prefer not to use it, Delphi requires that you send $25 to give your account a positive balance. This will be refunded after your first free hour if you choose to no longer use the system or it will be applied to future connect charges. If you do not maintain a positive balance, you will be charged $3.50 each month for direct billing.

## PEEK INTO THE RAINBOW

The CoCo SIG's conference feature allows you to meet electronically with other members of the CoCo Community. You can join conferences with notables such as Dale Puckett, Cray Augsburg, Marty Goodman, Don Hutchison, Jim Reed, Lonnie Falk and others — on a regular basis. Conference schedules will appear in THE RAINBOW each month. Be sure to check online announcements for changes and additions.

## THE OTHER SIDE OF THE RAINBOW

**On Delphi, you also are able to buy** RAINBOW ON TAPE — order a whole set, or download an individual program immediately. You can also renew your RAINBOW subscription, make a fast and easy order for software or hardware from a multitude of vendors, or inquire about products on the CoCo SIG.

We also have a number of **programs that you can download** and use, just for the cost of the time you spend transferring them. There'll also be **corrections for RAINBOW articles**, helpful hints and many other useful features.

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**THE RAINBOW is offering subscribers a free lifetime subscription to Delphi** — a $24.95 value — and a free hour of connect time — a $7.20 value at either 300, 1200 or 2400 Baud — so you can sample Delphi and the RAINBOW CoCo SIG. That's right. Your subscription to THE RAINBOW entitles you to this $32.15 value as a ***free bonus!***

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## How to reach RAINBOW's Color Computer SIG . . .

There are several ways to connect to Delphi and THE RAINBOW's CoCo SIG. In most cities you will not even have to pay long distance charges; you can use special data communications networks like Telenet, Tymnet and the Canadian Datapac network.

First, set your terminal program to operate at either 300 or 1200 Baud (depending on the modem you have), and also select either 7 bits with even parity or 8 bits with no parity, and one stop bit. (If one combination doesn't work, try another.)

Decide which network you should use. There is no surcharge for Telenet or Tymnet. Canadian residents using Datapac will be charged an additional $10.80 (U.S.) per hour.

**On Telenet:** Uninet network has merged with Telenet. To get the Telenet number for your area, call (800) 336-0437. After you call the local access number and make connection, press ENTER twice. When the "TERMINAL=" prompt appears, press ENTER again. When the "@" prompt appears, type `C DELPHI` and press ENTER.

**On Tymnet:** Call (800) 336-0149 to get the Tymnet number for your area. After you dial your designated number and connect, you will see either "garbage" or a message saying "please type your terminal identifier." At this point, even if the screen is garbled, simply press 'A'. When "please log in:" appears, type `DELPHI` and press ENTER.

**From Canada (on Datapac):** Call Delphi Customer Service at (617) 491-3393 to get the Datapac number for your area. After you connect, press the period key (.) and ENTER (use two periods if you're using 1200 Baud). Type `SET 2:1, 3:126` and press ENTER. Now type `p 1 3106, DELPHI;` and press ENTER. Delphi's new rates indicate an additional $10.80 hourly surcharge for evening use of Datapac, which means a total of $18 (U.S.) for connect time.

**From other countries:** Many countries have their own data networks that can connect to either Telenet or Tymnet. Check with the telephone authorities in your country for details on how to sign up for this service. When you have an account set up, you can reach Delphi with a "host code" of 3110 6170 3088 through Telenet, or 3106 90 6015 through Tymnet. (You'll have to pay the toll charges for this connection.)

**Type in Your Username**

If you're already a subscriber to THE RAINBOW, at the "USERNAME:" prompt, type `JOINDELPHI` and press ENTER. At the "PASSWORD:" prompt, type `RAINBOW`. Then, at the "NUMBER:" prompt, type your individual subscription number from the mailing label of your latest issue of THE RAINBOW. (If there are one or more zeros at the beginning of this number, include them.)

**If you don't already have a subscription**, at the "USERNAME:" prompt, type `JOINDELPHI` and press ENTER. At the "PASSWORD:" prompt, type `SENDRAINBOW` and press ENTER. Have your MasterCard, VISA or American Express card ready, because you'll be led through a series of questions that will enable us to put your RAINBOW and Delphi subscriptions into effect. In an effort to hold down non-editorial costs, we do not bill for subscriptions.

If you make a typing error, just use Control-X and start over. Remember that at any point, when you're on Delphi, you can type `HELP` to get help on how to use the system. To get off the system just type `BYE`.

If you find that you're unable to log on to Delphi and enter the CoCo SIG after following these instructions, call us during afternoon business hours at (502) 228-4492. We'll be glad to offer assistance.

**Come Visit Us! Type:** `GROUP COCO`

After you sign in, you'll be prompted to set up your own, personal "user name" — Delphi is a friendly service, no numbers to remember — and you'll be asked a number of questions so Delphi can set up your account. You'll also be assigned a temporary password.

Delphi will tell you that your account will be ready after 6 p.m. the same day if you sign up before noon (Eastern time zone.) If not, your account will be ready at 6 p.m. the next day. Once an account is verified and opened, *each RAINBOW subscriber will be credited with an hour of free time!*

When you log back in, use your chosen username and your temporary password to access the system. At that point, you will meet Max, who will help you configure things and will change your temporary password into your own *personal* password. This is the password you will use for subsequent sessions — or until you change it.

After Max bids you goodbye, you'll wind up at the Delphi Main Menu; type in `GROUP COCO` and **join us on the CoCo SIG!**

noticed that he doesn't have a mouth. A character without a mouth makes animating speech easy. The moving whiskers, ears and tail more than make up for CoCo Cat's lack of a mouth.

And so, in the memory chips of my trusty CoCo, *CoCo Cathead* was born. The program requires at least 32K, and can be seen and not heard, if you just want the graphics. But you can make CoCo Cat talk by adding data statements at the end of the program. I have even included a bad joke, which keeps *CoCo Cathead* in true form with his computer inspiration.

### The Program

Older CoCos may require that you `PCLEAR8` before running the program. I have used `PMODE2/1` with a color `POKE` to give us a maximum of four full visual screens. Be careful when you type in the listing. If you make an error in the `POKE` commands you could lock up your machine and lose the program. Be sure to save the program before trying to run it. This will save much heartache over a locked-up machine.

The program uses commands suggested by the instructions which came with the Tandy Speech-Sound Pak. I have inserted some graphic commands among these lines to give us animation along with speech.

Having four full screens to work with, we will do all of our viewing on Screen 4 (pages 7 and 8). Screens 1, 2 and 3 each have a different view of CoCo Cat. By `PCOPY`ing them to our viewing screen, you get clean animation. I have also included a `POKE178,`*n* command, with *n* representing a random number from 1 to 255. This gives us some impressive striped graphics for the background. It makes the cat quite 21st century-looking.

I have given CoCo Cat a tux and bow tie, but no sunglasses. That would have spoiled the effect of the blinking eyes and eyebrows. His ears and tail also bounce around a bit. In fact, he is fun to watch, even without speech.

### Running the Program

On running the program, you will see our familiar title card. Pressing ENTER starts the program. You have to wait for about 20 seconds while the graphics are created. If you want to watch the pages being drawn, insert a value of `Q=1` after the `PCLEAR8` statement. This turns on the screens for you to watch. But I think the program seems better when you don't watch the pages being drawn.

CoCo Cat will then proceed to talk to you and flash his different expressions and graphic screens. He even stutters a bit, adding to the Headroom effect.

When he has finished talking, he goes into a loop, changing screens until you stop the program or turn off your CoCo. That's it! It doesn't do anything practical, but we did say this month was just for fun, right?

### Adding Your Own Speech

You can make CoCo Cat say anything you want simply by adding your own `DATA` lines between lines 1000 and 5000, which is the `END` statement. The only limit is the amount of memory you have left. You may want to add a little stutter to his speech. Remember, some text will have to be sounded out, but that is a problem with the hardware, not the software.

I hope you have fun with your new companion. Let me know how you like *CoCo Cathead*, and be sure to write if you have any more suggestions for future projects. ☐

---

*Hint . . .*

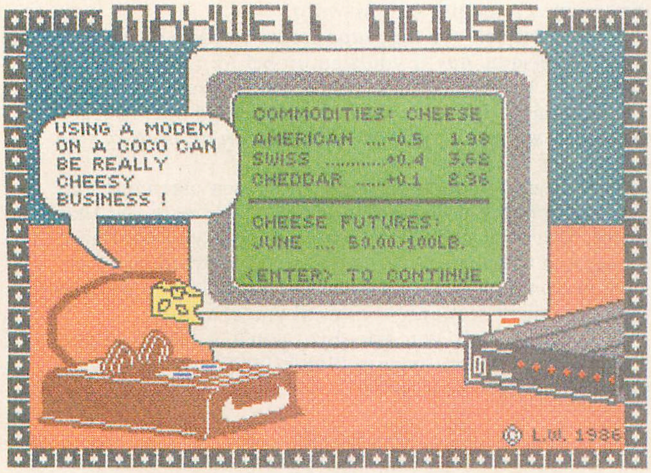
## Disk Directory Printout

If you have a long disk directory and want to see all of it, or if you simply wish to have a hard copy printout of your directory, one simple command allows you to do this easily.

Just `POKE 111, 254:DIR` and the entire disk directory will appear on your printer, even if it is too long to be fully displayed on the screen.

---

## Mouse Tales by Logan Ward



---

## Corrections

**"High Resolution Joystick Interface" (Review, October 1987, Page 130):** The review of the High Resolution Joystick Interface from Radio Shack erroneously states that cleaning your joystick ports with tuner cleaner will clear up the apparent jerky operation. It is true that tuner cleaner should be used. However, you should use it on the joystick *pots*, not the ports. Do *not* spray tuner cleaner into the joystick ports on the rear of your CoCo!

**"Screen Dump Extraordinaire" (October 1987, Page 30):** The `SCRNDMP` listing on Page 32 has part of Line 180 inserted in Line 140. Here are the correct listings for lines 140 and 180:

```
140 PRINT"     As an example, one
 printer uses the  sequence 27,4
2,4,128,2 where the codes  128 a
nd 2 represent 128 + 2*256 = 640
   dots per line.

180 IFINSTR(C$,",")=0THEN190ELSE
C$=RIGHT$(C$,LEN(C$)-INSTR(C$,",
")):K=K+1:GOTO180
```

**For quicker reference, Corrections will be posted on Delphi as soon as they are available in the Info on Rainbow topic area of the database. Just type `DATA` at the CoCo SIG> prompt and `INFO` at the TOPIC> prompt.**

|  |  |  |  |
|---|---|---|---|
| 160 | 99 | 680 | 231 |
| 340 | 68 | 810 | 228 |
| 490 | 26 | 1010 | 217 |
| 570 | 79 | END | 195 |

**The listing:** CATHEAD

```
10 REM ************************
20 REM * TALKING COCO CATHEAD *
30 REM *   BY FRED B.SCERBO   *
40 REM *    60 HARDING AVE.   *
50 REM * NORTH ADAMS,MA 01247 *
60 REM *  COPYRIGHT (C) 1987  *
70 REM ************************
80 PCLEAR8
90 CLS0:PRINTSTRING$(32,168)STRI
NG$(32,184);:FORI=1TO 256 :READ
A:PRINTCHR$(A+128);:NEXT
100 PRINTSTRING$(32,184)STRING$(
32,168);
110 DATA46,44,44,42,62,60,60,58,
117,124,124,125,117,124,124,122,
126,125,124,122,26,,26,30,28,29,
21,28,29,21,28,27
120 DATA42,33,35,34,58,49,51,50,
117,,,,117,,,122,120,117,,120,26
,,26,26,,,21,,21,21,,21
130 DATA42,37,,42,58,53,,58,117,
,,,117,,,122,,117,,,26,,26,26,,,
21,,21,21,,21
140 DATA42,37,,42,58,53,,58,117,
,,,117,115,115,122,,117,,,27,19,
26,27,19,,21,19,23,21,112,21
150 DATA42,37,,42,58,53,,58,117,
,,,117,,112,122,,117,,,26,,26,26
,,,21,,21,21,,21
160 DATA42,37,35,42,58,53,51,58,
117,,,,117,,,122,,117,,,26,,26,2
6,,,21,,21,21,,21
170 DATA42,,32,34,58,,48,50,117,
,,113,117,,,122,,117,,,26,,26,26
,,17,21,,21,21,,23
180 DATA44,44,44,40,60,60,60,56,
116,124,124,124,116,,,120,,124,1
20,,24,,24,28,28,28,20,,20,20,28
,24
190 PRINT@422,"  BY FRED B.SCERB
O  ";
200 PRINT@454," COPYRIGHT (C) 19
87 ";
210 IFINKEY$<>CHR$(13)THEN210
220 PRINT@486,"  PLEASE STAND BY
!  ";
230 XX=&HFF00:YY=&HFF7E
240 POKEXX+1,52:POKEXX+3,63
250 POKEXX+35,60
260 PMODE4,1:PCLS1:PMODE4,5:PCLS
1
270 GOTO380
280 FORII=1TOLEN(AA$)
290 PCOPY1TO7:PCOPY2TO8
300 IF PEEK(YY)AND 128=0 THEN300
310 PCOPY5TO7:PCOPY6TO8
320 POKEYY,ASC(MID$(AA$,II,1))
330 NEXTII
340 IFPEEK(YY)AND128=0THEN340
350 PCOPY3TO7:PCOPY4TO8
360 POKEYY,13
370 RETURN
380 PMODE2,1:PCLS1:PMODE1:PCLS0:
POKE65314,248:SCREENQ,Q
390 GOSUB400:GOTO460
400 LINE(0,0)-(256,192),PRESET,B
410 CIRCLE(82,110),40,1,.9,.2,.8
5:CIRCLE(174,110),40,1,.9,.65,.3
:CIRCLE(128,64),54,1,.9,.46,.05
420 CIRCLE(128,172),62,1,.6,.67,
.85:CIRCLE(108,68),6,1:CIRCLE(14
6,68),6,1:PAINT(108,68),1,1:PAIN
T(146,68),1,1
430 DRAW"BM136,90C1M-10,-40L8G4M
136,90":PAINT(128,70),1,1
440 DRAW"BM114,140D18ND30R28ND30
NU18M+40,-8F4D20G4NF30M-40,-8NU1
0L28NU10M-40,+8NG30H4U20E4M+40,+
8":POKE178,52:PAINT(128,160),,1:
POKE178,72:PAINT(110,160),,1:PAI
NT(146,160),,1
450 POKE178,0:PAINT(108,180),1,1
:PAINT(150,180),1,1:RETURN
460 PCOPY1TO3:PCOPY2TO4:PCOPY1TO
7:PCOPY2TO8
470 DRAW"BM90,30C1M-4,-20M+24,+1
0BR30M+24,-10M-4,+20"
480 DRAW"BM14,192U140NL4NH6NU4R3
4D30L12U16L8D130"
490 DRAW"BM255,20C1H20L20F40D20H
60L20F80D20H100L20F16BF16F88D20H
74BH48H18L20F20BF98F42D20H50BH11
8H12L20F34BF104F52L20H46BH98H46L
20F62BF80F10BF20F10BL20BH26H8BH7
2H22BH6H42"
500 DRAW"D20F24BF24F8BF58D20H18B
H48H20BH14H14D20F14BF14F16BF34F8
BF38L20BH34H42BH14H14D20F14BF14F
56L20H36BH14H14D20F14BF14F16L20B
H12H10"
510 PCOPY1TO5:PCOPY2TO6
520 FORI=10TO250STEP40:PAINT(I,6
),2,1:NEXT:FORI=6TO192STEP40:PAI
NT(6,I),2,1:NEXT:FORI=28TO196STE
P40:PAINT(32,I),2,1:NEXT:PAINT(5
0,82),2,1:PAINT(104,146),2,1:PAI
NT(148,150),2,1
530 PAINT(188,178),2,1:FORI=98TO
178STEP40:PAINT(220,I),2,1:NEXT
540 POKE178,14:FORI=30TO250STEP4
0:PAINT(I,6),,1:NEXT:FORI=26TO19
```

# T & D SUBSCRIPTION SOFTWARE CONTINUES ITS

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- GAME OF LIFE
- ELECTRONICS VII
- FLIGHT SIMULATOR

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| 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 |

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```
2STEP40:PAINT(6,I),,1:NEXT:FORI=
8TO196STEP40:PAINT(32,I),,1:NEXT
550 PAINT(50,62),,1:PAINT(94,146
),,1:PAINT(144,152),,1:PAINT(174
,148),,1:PAINT(196,168),,1
560 FORI=192TO62STEP-40:PAINT(21
4,I),,1:NEXT:PAINT(184,74),,1
570 FORI=100TO126STEP12:CIRCLE(6
0,I),40,1,.2,.5,1:CIRCLE(196,I),
40,1,.2,.5,1:NEXT
580 DRAW"C1BM128,58BL20L18U2NR8U
2NR4U2M+18,+6BR38R18U2NL8U2NL4U2
M-18,+6"
590 PMODE2,5:PMODE1,5:POKE65314,
248:SCREENQ,Q
600 PAINT(108,68),4,4:PAINT(146,
68),4,4
610 CIRCLE(108,68),10,1,.7,1,.5:
CIRCLE(146,68),10,1,.7,1,.5
620 POKE178,14:FORI=10TO250STEP4
0:PAINT(I,6),,1:NEXT:FORI=6TO192
STEP40:PAINT(6,I),,1:NEXT:FORI=2
8TO196STEP40:PAINT(32,I),,1:NEXT
:PAINT(50,82),,1:PAINT(104,146),
,1:PAINT(148,150),,1
630 PAINT(188,178),,1:FORI=98TO1
78STEP40:PAINT(220,I),,1:NEXT
640 FORI=30TO250STEP40:PAINT(I,6
),2,1:NEXT:FORI=26TO192STEP40:PA
INT(6,I),2,1:NEXT:FORI=8TO196STE
P40:PAINT(32,I),2,1:NEXT
650 PAINT(50,62),2,1:PAINT(94,14
6),2,1:PAINT(144,152),2,1:PAINT(
174,148),2,1:PAINT(196,168),2,1
660 FORI=192TO62STEP-40:PAINT(21
4,I),2,1:NEXT:PAINT(184,74),2,1
670 FORI=100TO126STEP12:CIRCLE(6
0,I),40,1,.4,.5,1:CIRCLE(196,I),
40,1,.4,.5,1:NEXT
680 DRAW"C1BM128,48BL20L18U2NR8U
2NR4U2M+18,+6BR38R18U2NL8U2NL4U2
M-18,+6"
690 PMODE2,3:PMODE1,3:POKE65314,
248:SCREENQ,Q
700 GOSUB710:GOTO770
710 DRAW"BM82,38C1M-6,-24M+24,+1
0BR52M+24,-10M-6,+24"
720 DRAW"BM14,192U170NL4NH6NU4R3
4D30L12U16L8D160"
730 DRAW"C1BM128,52BL20L18U2NR8U
2NR4U2M+18,+6BR38R18U2NL8U2NL4U2
M-18,+6"
740 POKE178,RND(255):PAINT(10,5)
,,1
750 FORI=100TO126STEP12:CIRCLE(6
0,I),40,1,.6,.5,1:CIRCLE(196,I),
40,1,.6,.5,1:NEXT
760 RETURN
770 PMODE1,7:SCREEN1,1:POKE65314
,248
780 GOTO840
790 FORY=1TO20:PCOPY1TO7:PCOPY2T
O8:FORI=1TO30:NEXTI:PCOPY5TO7:PC
OPY6TO8:FORI=1TO30:NEXTI,Y
800 FORY=1TO10:PCOPY3TO7:PCOPY4T
O8:FORI=1TO80:NEXTI:PCOPY5TO7:PC
OPY6TO8:FORI=1TO30:NEXTI,Y
810 PMODE2,3:PMODE1,3:PCLS4:POKE
65314,248
820 GOSUB400:GOSUB710
830 GOTO790
840 READ AA$:IFAA$="END"THEN790
850 PMODE1,7:SCREEN1,1:POKE65314
,248
860 PCOPY1TO7:PCOPY2TO8:FORI=1TO
50:NEXTI:PCOPY5TO7:PCOPY6TO8:FOR
I=1TO50:NEXTI
870 GOSUB280
880 PCOPY1TO7:PCOPY2TO8:FORI=1TO
50:NEXTI:PCOPY5TO7:PCOPY6TO8:FOR
I=1TO50:NEXTI
890 FORY=1TO3:PCOPY3TO7:PCOPY4TO
8:FORI=1TO80:NEXTI:PCOPY5TO7:PCO
PY6TO8:FORI=1TO30:NEXTI,Y
900 PMODE2,3:PMODE1,3:PCLS4:POKE
65314,248
910 GOSUB400:GOSUB710
920 GOTO840
930 REM START SPEECH DATA HERE
1000 DATA HELLO O O O,I AM KAHKA
HKAHKAHKO KO KAT
1010 DATA I HAVE BBBBBEEN IN THE
 RAINBOW FOR A LONG LONG WHILE
1020 DATA THIS IS MY NA NA NA NE
W LLLLLLOOK
1030 DATA YOU N.N.N.NEVER THOUGH
T I WOULD BE LIKE THIS
1040 DATA DID YOU U U U U
1050 DATA YOU FORGOT HOW HOW GOO
D A CO CO WAS....AYH
1060 DATA O K....I HAV A JOKE FO
R YOU
1070 DATA WHY DIDNT THE CO CO OW
NER CROSS THE STREET
1080 DATA GIVE UP YET
1090 DATA O K...I'LL TELL YOU
1100 DATA WITH A CO CO...HE DOES
NT NEED TO GO ANYWHERE
1110 DATA WHAT
1120 DATA THAT'S NOT FUNNY
1130 DATA WELL EX CUUUUUUUZE ME
1140 DATA I MUST BE OVERHEATING
1150 DATA SEE YOU LATER
1160 DATA I'LL JUST CHANGE CUHLO
RS FOR A WHILE
5000 DATA END
```

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Not only does Tandy produce our favorite CoCo, we think they produce the best and best-priced laptop portable and MS-DOS computers as well. We've found that when satisfied Color Computer users decide to add portability or move to MS-DOS, many stick with Tandy. For these people we publish PCM, The Personal Computer Magazine for Tandy Computer Users.

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Please note: The tapes and disks offered by The Rainbow Bookshelf are not stand-alone products. That is, they are intended to be an adjunct and complement to the books. Even if you buy the tape or disk, you will still need the appropriate book. OS-9® is a registered trademark of the Microware Systems Corporation.

# PIPELINE

**PARENTAL GUIDANCE** Can parents be held legally responsible for acts of software piracy by their teen-age children? Jonathan D. Wallace, Esq., a computer lawyer representing the plaintiff in a case pending in federal court in New York (Weaver vs. Doe), believes they can.

Weaver, the plaintiff, owns the copyright of *Cards*, a commercially distributed card-playing Simulation for the Atari ST computer. The teen-age defendant allegedly operated a pirate BBS from which users could download *Cards* and other copyrighted programs. Although software companies have sued software pirates before, this is the first case Wallace is aware of in which the pirate's parents have also been sued.

According to Wallace, the case raises a question of first impression under the copyright law. "Our argument is that a parent who supplies the computer equipment and telephone line, which is used to operate a pirate bulletin board, and who then tolerates the trading of pirated software, contributes to the copyright infringement," Wallace said. "Since teen-agers usually have no assets with which to pay a judgment, holding the parents responsible will give strong incentive to families not to condone this type of behavior."

**SMOOTH TALKING** Swisscomp Inc. has introduced the Smart Speaker, a text-to-speech product offering many features not available on other text-to-speech converters.

The Smart Speaker will connect to any computer having a standard parallel or serial port. It will also work with any software that puts out ASCII to drive a printer. In addition, its built-in AB switch allows it to share a single port with your existing printer.

The Smart Speaker is designed to convert ASCII text to speech, pronouncing the text through its built-in speaker. Numbers and text separated by spaces or periods are spelled out. No software or programming is required by the user to make the Smart Speaker work. Additionally, the Smart Speaker can drive an external amplifier, VCR, tape recorder or phone answering system through its line output. A facility to connect an external speaker is also provided.

Smart Speaker is available as a stand-alone unit complete with parallel cable and power supply for $229.95. It is also available as a package, which includes the Smart Speaker, a Hayes-compatible 1200 baud modem, a clock calendar and order processing software for the IBM PC/XT/AT and Compatibles for $549.95. *For more information, contact Swisscomp Inc., 5312 56th St., Tampa, FL 33610, (813) 628-0906.*

**FIRST COCO PRODUCT** The United Computer Federation announced the release of its first Color Computer product, The Insider, an internal clock card for the Color Computer 2 and 3.

The clock card is designed to plug into the CoCo internally, thus freeing the ROM port and multi-pack interface and giving the CoCo owner true time capabilities.

The Insider comes complete with Radio Shack Disk Extended Color BASIC, and OS-9 drivers. The Insider clock card's suggested retail price is $49.95 and will be available through dealers and directly from the United Computer Federation.

Headquartered in San Fernando Valley, California, the United Computer Federation is a Color Computer users group with chapters covering many parts of the United States. If you would like additional information on the Insider clock card or the U.C.F., contact *The United Computer Federation, 366 W. Providencia Avenue, Burbank, CA 91506, (818) 840-8902.*

**COMPUTERS AND ART** From music videos to paintings to special effects for ballet, *Digital Visions*, a 176-page book, examines the computer's far-reaching impact on the visual arts and the creative process. Included are computer-assisted works by such prominent artists as Andy Warhol, David Hockney, Jennifer Bartlett, Larry Rivers, and Philip Pearlstein, as well as creations by artists like David Em and Melvin Prueitt, who have worked exclusively on the computer and have only recently begun to receive attention outside the computer-graphics community.

More than 140 illustrations, including 100 color plates, offer an exciting look at the ways painters, sculptors, architects, filmmakers, choreographers, performance artists and animators are using the computer today. The prices are $29.95 hardcover, $19.95 paperback.

Cynthia Goodman, an art historian and the leading expert on computer-aided art, traces the development of this intriguing liaison between artists and computers and explores some spectacular directions for the art of the future.

*Digital Visions* accompanies museum exhibition opening in Syracuse, New York, at the Everson Museum beginning Sept. 18 through November 8 and traveling to The Contemporary Art Center in Cincinnati, Nov. 27 through Jan. 9, 1988; IBM Gallery, NY, April 26 through June 18, 1988; Dayton Art Institute, Dayton, OH, Oct. 20 through January 10, 1989; and White Museum, University of California (dates not set yet). *Contact Harry N. Abrams, Inc., 100 Fifth Avenue, New York, NY 10011.*

**NEW FROM TANDY** In celebration of their 10th anniversary of computer products, Tandy announced six major product additions and changes August 3, 1987, at the Waldorf-Astoria Hotel in New York city.

The Tandy 4000 is Tandy's entry into the expanding 80386 market. The 4000 boasts a clock speed of 16MHz, 1Mb of RAM, two XT-compatible slots and six AT slots, one 32-bit memory slot, a 1.44Mb, 3½-inch floppy drive, one serial and one parallel port, an enhanced keyboard, a keylock chassis and room for a total of 16Mb of RAM and two additional half-height peripherals. The Tandy 4000 lists for $2,599.

The Tandy 3000 contains all the features offered by its predecessor but includes a sleeker case designed to hold three half-height peripherals. It has also been redesigned to operate at 12MHz with one wait state. Like the 4000, it has a keylock chassis and an enhanced keyboard. The Tandy 3000 lists for $1,999.

The changes to the Tandy 3000 HL include an enhanced keyboard, a keylock chassis and a retail price of $1,499. Other than that, the machine remains virtually the same as earlier 3000 HL machines.

The Tandy 1400 LT marks Tandy's first entry into the PC-compatible laptop computer market. With 768K of RAM, a V20 running at 7.16MHz, a backlit Super-Twist LCD display, an external keyboard, external disk drive, CGA and composite video ports, it is one of the most feature-packed laptops on the market at any price. List price for the 1400 LT is $1,599.

The Tandy 1000 TX is an 80286-based Tandy 1000. With 640K of RAM and room for an additional 128K of "video RAM," it lists for $1,199. The 1000 TX has an 8MHz '286, serial and parallel ports, CGA graphics and a 3½-inch, 720K floppy built-in drive.

In addition to these computers, Tandy has introduced the LP-1000 Laser Printer. This powerful printer includes 1.5Mb of RAM and HP LaserJet compatibility and can print full-page 300 DPI graphics. It features several built-in fonts and typestyles as well as emulation of the IBM ProPrinter, QuietWriter and the Tandy DMP-2110. Input is taken through a standard Centronics parallel port. The LP-1000, at a retail price of $2,199, is one of the best values on the laser printer market today.

For more information on these products and many others to appear in the new 1988 Radio Shack Computer Catalog, visit your Radio Shack Computer Center.

Sugar Software

### ☞ Just For the Fun of It ☜

Order any item by December 31, 1987 and you may have your choice of either the **Silly Syntax** *story creation game* (including two stories) or the **Flying Tigers** *arcade game* for only **$1.95!**

## CALLIGRAPHER

**CoCo Calligrapher** - (Hybrid BASIC/ML) Turn your CoCo and dot-matrix printer into a calligrapher's quill. Make beautiful invitations, flyers, certificates, labels and more. Includes 3 fonts: *Gay Nineties, Old English* and *Cartoon.* The letters are ½ inch high and variably spaced. Works with many printers including Epson, Gemini, Radio Shack, Okidata 92A, Banana and Prowriter. Additional fonts are available (see below). Tape/Disk; **$24.95.**

**OS9 Calligrapher** - (C) Although a different program from the CoCo Calligrapher, the OS9 Calligrapher prints all the same fonts. It reads a standard text file which contains text and formatting directives. You may specify the font to use, change fonts at any time, centering, left, right or full justification, line fill, margin, line width, page size, page break and indentation. Similar to *troff* on UNIX™ systems. Includes Gay Nineties, Old English and Cartoon fonts. Additional fonts are available (see below). Disk only; OS9 Level I or II; **$24.95.**

**Calligrapher Fonts** - Requires Calligrapher above. Each set on tape or disk; specify RSDOS or OS9 version; **$14.95** each. **Set #1** - (9 fonts) Reduced, reversed and reduced-reversed versions of Gay Nineties, Old English and Cartoon; **Set #2** - (8 fonts) Old Style and Broadway; **Set #3** - (8 fonts) Antique and Business; **Set #4** - (8 fonts) Wild West and Checkers; **Set #5** - (10 fonts) Stars, Hebrew and Victorian; **Set #6** - (8 fonts) Block and Computer;

**Economy Font Packages** on disk; specify RSDOS or OS9; **29.95: Font Package #1** - Above font sets 1, 2 and 3 (25 fonts) on one disk. **Font Package #2** - Above font sets 4, 5 and 6 (26 fonts) on one disk. Both Packages #1 and #2 (51 fonts) on one disk; **49.95.**

**Calligrapher Combo** Package - *Everything!*; specify RSDOS or OS9; Includes the Calligrapher and both Font Packages on two disks; **$69.95.**

## UTILITIES

**Piratector** - (100% ML) Utility to allow your own *disk-based* BASIC or ML programs to display a graphics title screen and then self-start after loading. Adds copy protection to your programs but still allows users to create *non-executable* backups! Includes Semigraf. Disk only; CoCo 1, 2, 3 (except Semigraf); **$39.95.**

**Super Screen Machine** - (100% ML) Put your CoCo into high resolution mode for your own BASIC or ML programs. Smooth scroll, key click, lower case with colored characters. Tape/Disk; 32K CB; CoCo 1, 2, 3 (except 64K mode); **$19.95.**

**Color Disk Manager** - (100% ML) Disk utility with these features: Disk repair, selective track initialization, verify sectors, backups, tape to disk transfer, ROM Pak execution from disk, much more! Tape/Disk; CoCo 1, 2, 3 (except for 64K mode); **$24.95.**

**Color Tape Manager** - (100% ML) Tape utility with these features: display start, end and exec address of ML programs, convert ML programs into *DATA* statements, append ML to BASIC, much more! Tape/Disk; 16K ECB; CoCo 1, 2, 3 (except for 64K mode); **$19.95.**

**OS9 Patcher** - (C) Display and modify the contents of a file or memory module. Hexidecimal, decimal and ASCII modes. Search feature. Calculates module CRCs; Generates patch command files. Disk only; OS9 Level I or II; **$19.95.**

## INFORMATION MGT.

**TIMS (The Information Management System)** - (Hybrid BASIC/ML) Tape or disk, fast and simple general data base program. Create *files* of *records* that can be quickly sorted, searched, deleted and updated. Powerful printer formatting. Up to 8 *user* fields, sort on up to 3 fields. Tape/Disk; **$19.95** (see combo pkg below).

**TIMS Mail** - (Hybrid BASIC/ML) Tape or Disk based mailing list management program. Files are compatible with TIMS. Fast and simple to use. Supports labels 1, 2 or 3 across, 2½ to 4 inches wide. Tape/Disk; **$19.95** (see combo pkg below).

**TIMS Utility** - (Hybrid BASIC/ML) Utility companion for TIMS and TIMS Mail to allow multi-term search (*AND* and *OR* logic), global change and delete, split large files and more! Tape/Disk; **$14.95** (see combo pkg below).

**TIMS Combo Package** - All three of the above programs: TIMS, TIMS Mail and TIMS Utility on one disk - **$34.95.**

## SPORTS STATISTICS

Statistics programs for the coach, team manager or avid fan who wants to keep accurate team and opponent records. Printer output supported. The following are available: Baseball, Basketball, Football and Soccer. Disk only; **$19.95** each.

## EDUCATIONAL

**Trig Attack** - (100% ML) Ages 9 and up. In this educational arcade game, enemy *trigs* travel along math curves. Players learn important mathematical concepts as they play. Sound effects, colorful graphics. Excellent manual includes an introduction to trigonometry. Tape 16K CB/Disk 32K ECB; CoCo 1, 2, 3; **$19.95.**

**A complete catalog of other sweet Sugar Software products is available.**

**Silly Syntax** - (Hybrid BASIC/ML) Ages 5 and up. Story creation game; output to screen or printer; includes 2 stories or create your own. Tape/Disk; **$19.95** or disk with 62 stories for **$29.95.** Sets of 10 stories on tape/disk for **$4.95:** Fairy Tales, Current Events, X-Rated, Sing-Along, Adventure, Potpourri.

**Bible Stories Adventure** - (Hybrid BASIC/ML) Ages 4 & up. A graphics adventure game for young children & their families. Old testament. Tape/Disk; **$19.95.**

**The Presidents of the USA** - (100% ML) Ages 10 and up. Two trivia games, user modifiable, printer output supported. Tape/Disk; 16K ECB; **$19.95.**

**The Great USA** - Ages 9 and up. Trivia game of the 50 states. Capitals, nicknames, abbreviations, flowers, trees and birds. Tape/Disk; 16K ECB; **$19.95.**

**Galactic Hangman** - Ages 7 and up. Exciting new twist to the popular word game. Outstanding graphics; 700 word vocabulary. Tape/Disk; 16K ECB; **$19.95.**

**PreReader** - (Hybrid BASIC/ML) Ages 3-5 (level I); Ages 5-7 (level 2); Great graphics and music. Level 1: match colors, shapes, letters and numbers; Level 2: match letters and consonant blends with their sounds. Tape/Disk; Joystick; **$19.95.**

**Statgraf** - High school and college level; Linear regression analysis program combined with a plotting and line graphing system. Up to 250 x/y pairs; data transformation; residuals; regression line; print graph with screen print program (not supplied); Tape/Disk; **$19.95.**

## SPECIAL INTEREST

**Rental Property Income and Expense Management Package** - Maintain your rental property income and expense records. Print output supported. 28 expense categories. *This program may be tax deductible.* Disk only; **$29.95.**

**Radio Systems Design Calculations** - Performs 14 different calculations commonly used in design or evaluation of land mobile radio systems, satellite TV, etc. Tape/Disk; **$19.95.**

**CoCo Knitter** - Easy to use program to display or print instructions to knit a sweater: Cardigan or Pullover; Round or V-neck; Raglan or Set-in Sleeve; 3 weights or yarn; 8 sizes from baby to man. Tape/Disk; **$19.95.**

**Flying Tigers** - (100% ML) Fast *Defenders* style arcade game. 5 levels of difficulty; Outstanding graphics and sound effects. Tape/Disk; Joystick; **$19.95.**

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# Commanding the Pack

### By Richard E. Esposito
### Rainbow Contributing Editor
### with Richard W. Libra

*I read a question in your column in the August 1987 issue from Daryl Fortney. He said his RS-232 Program Pak wouldn't function on the CoCo 3 properly. The problem wasn't CoCo 3 incompatibility but the command he issued to start the pack's program. He should use* `EXEC &HE010` *instead of* `&HC000`*. This change was made clear in CoCo 3 manuals.*

*Clay G. Kunz*
*Colorado Springs, CO*

℞ Thanks for keeping me honest.

### Code on Call

*I must disagree with your answer to Lee Steensland (Page 127, September 1987). He's looking for an Xmodem program to run under RS DOS. I've been using* Xcom9 *(which you recommended) and have modified the source code — it's a super program, but requires OS-9, and would be very difficult to convert to RS DOS. I think he'd be better off trying to modify* Greg-E-Term *or* MikeyTerm.

*James A. Sanford*
*Hampton, VA*

℞ The reason I mentioned *Xcom9* is that the source code for it is readily available. For *Greg-E-Term* and *MikeyTerm*, it is not.

### Gray Drives with CoCo 3

*I'm thinking about buying a CoCo3, but I have two of the gray drives Extended Color BASIC 1.0. What do I have to do to make them work with the CoCo 3?*

*Aaron Wadkins*
*Kernersville, NC*

℞ If you want to run your CoCo at 2 MHz and/or use OS-9 Level II, you will need to replace your 12-volt disk controller. If one MHz suffices, you will need a CoCo 3-ized Multi-pak to supply the 12 volts or make some hardware modifications to supply it.

### *Telewriter 64* Fix

*I have the tape version of* Telewriter 64. *I read an article in the September 1985 issue of* HOT CoCo *that dealt with program hang-ups on double letters; however, this "fix" only deals with the disk version. Is there a way to fix the version that I have?*

*James Zoyiopulos*
*Peterborough, NH*

℞ The following patch makes the original tape version of *Telewriter 64* compatible with the newer BASIC 1.1 and 1.2 ROMs:

```
59 CLOADM"",OF: GOSUB 500:
   POKE39,PEEK(214): POKE40,
   PEEK(215): GOSUB330
500 POKEOF+7931,PEEK(40960):
   POKEOF+7932,PEEK(40961)
510 POKEOF+8207,PEEK(40960):
   POKEOF+8208,PEEK(40961)
520 POKEOF+9728,PEEK(40960):
   POKEOF+9729,PEEK(40961)
530 RETURN
```

---

*Richard Esposito is a senior project engineer with Northrop Corp. He holds bachelor's, master's and doctorate degrees from Polytechnic Institute of Brooklyn. He has been writing about microcomputers since 1980.*

*Richard Libra is a simulator test operator for Singer Link Simulation Systems Division.*

### MC-10 Compatibility

*I purchased (by mistake) some micro-computer games for the MC-10. How can I get them to run on my 64K CoCo 1? They load OK, but won't run. Is there some peek or poke that I need? Doesn't the MC-10 use the same BASIC as the CoCo?*

*Edward Poter*
*Cherry Hill, NJ*

℞ The tapes are in the same format, but the BASIC interpreter's tokens have different values. The MC-10, in addition to having a different memory map, uses a 6803 microprocessor whereas the CoCo uses a 6809, which has a different machine language instruction set. If the programs are in BASIC, refer to Dan Downard's article "Opening CoCo's Library to the MC-10" which appeared in the October 1983 issue of RAINBOW. It contained a cross-reference listing of BASIC tokens as well as an assembler listing of a program to perform the conversion. If they are in machine language, the conversion is not worth the effort.

### Drive Track Transfers

*I have a CoCo 3 with an original gray disk drive and a TRS-80 Model 1 with Drive 1, plus the latest CoCo drive controller. I recently acquired a pair of Mitsubishi drives, which are double-sided, and would like to use them with the Model 1 drive in the 35-track configuration, or as 0-1-2-3 in the 40-track format. I have OS-9 Level II and can use the drives as two 40-track, double-sided drives with no trouble. I would also like to know if I can transfer OS-9 and BASIC09 to a 40-track disk. I have tried, but all I get is Error #249. Is there a way to transfer 35-track disks to 40-track?*

*Bill Clark*
*New Paltz, NY*

℞ If you use the old Radio Shack drives along with the new ones (four drives total), you will need a four-drive cable with missing teeth where the old Radio Shack drives are to be connected, because those old drives do not have drive select jumpers. Note that with four drives hooked up, you cannot use the double-sided option under OS-9, because the side select signal would be used for the selection of Drive 3. If you decide to go with three drives, you can have your two new drives running double-sided under OS-9 Level II. You can transfer 35-track disks to 40-track disks using the `COPY` command or piping the output from `DSAVE`. `BACKUP` will only work with like-formatted disks.

### Patching HSCREEN

*Is there a way to prevent the* `HSCREEN` *command from clearing the screen on the CoCo 3?*

*David Hanson*
*Salt Lake City, UT*

℞ Since BASIC on the CoCo 3 is all in RAM, you can patch it by poking addresses `&HE6C6` and `&HE6C7` with `&H12`.

### Manual Miscall

*On Page 164 of the CoCo 3 ECB manual, there is a sample program demonstrating* `GET` *and* `PUT` *in* `PMODE 3`. *Line 25 dimensions a two-dimensional array that uses 2,228 bytes. However, I can substitute* `DIM (12)` *and use only 83 bytes, and the program works just fine. I've found that the same technique works in* `PMODE 4`, *but the manual implies that all such array must be two-dimensional. What gives?*

*David Francis*
*Prospect, KY*

℞ The manual is wrong.

### Pak and Pin Problems

*My modem won't receive any incoming signal from the RS-232 Program Pak. I can dial out with the modem but cannot see incoming data on my monitor. The RS-232 will not run the printer at all. Everything else works fine. My computer is a CoCo 2 Revision B. Is Pin 2 preventing the printer from sending the ready signal? Also, do you know of any way that I can get a diagram for my revision CoCo?*

*Ricky Sutphin*
*Henry, VA*

℞ Pin 1 on your computer corresponds to a status line, Pin 2 to RS-232 IN, Pin 3 to ground and Pin 4 to RS-232 OUT. To aid in repair, Radio Shack sells service manuals for all versions of the CoCo. For example, the CoCo 3 (Model 26-3334) has a repair manual number of MS-2603334, which is "MS-" followed by the model number of the machine. The manuals contain full schematics and troubleshooting information that you are looking for. The manuals must be ordered from National Parts as they are not stocked by most dealers.

### Unnecessary Upgrade

*I have a 64K CoCo 2 (32K RAM), Revision B that I want to upgrade to 64K. I purchased a 64K upgrade kit from Howard Medical Computers, but*

***
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*it was for the current Korean unit. I sent it back and did not reorder because the directions state that after the kit is installed I should have 22839 bytes of RAM. My computer already has that amount. I am confused that installing an upgrade does not increase available RAM. Any help as to chips to replace and cuts or jumpers will be appreciated.*

*Joseph Califano*
*New Port Richey, FL*

℞ The installation of new 64K memory chips in your unit will not make more memory available to Disk Extended BASIC. In fact, you already have 64K memory chips. The upper 32K is occupied by the BASIC interpreter.

### OS-9 PASCAL Patch

*When I try to run PASCAL under OS-9 Level II, it immediately aborts with Error #216, Pathname Not Found. Is there a fix?*

*Mark Goldberg*
*Bronx, NY*

℞ Thanks to Greg Law for the following information: In the program PASCAL there is a minor bug in the specification of the access mode for the open calls of the two files `Pascal_Compiler` and `PascalErrs`. As distributed, those two files are in the execution directory. When PASCAL opens those two files in the `READ` mode, it attempts to locate them in the current data directory. The following patch changes the access modes of the open calls to `EXECUTE+READ` so that they are correctly located in the current execution directory:

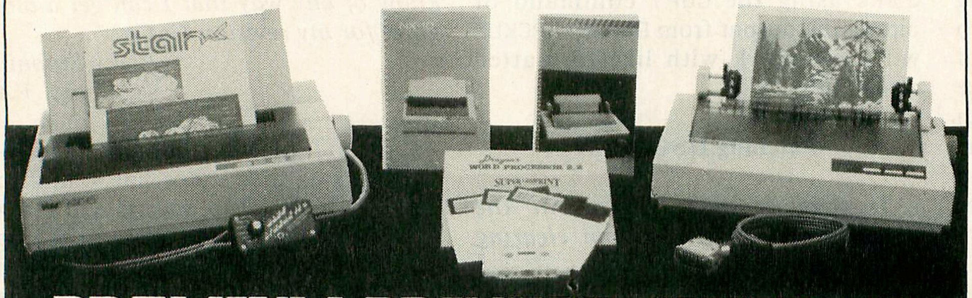
```
load pascal
modpatch -s
 l Pascal
c 0697 21 25
c 1692 21 25
v
```

After the patch is made, use the Level I `save` utility, which is Level II compatible, to put the patched version of PASCAL on disk.

Greg also offers the following patch, which makes the Level I, Version 2 `login` command compatible with Level II. Using it with the Level I version of `tsmon`, which does not require a patch, you can amaze your friends who own inferior machines with a real time-sharing system.

```
load login
modpatch -s
l login
c 0052 20 49
c 0053 30 20
c 0054 31 32
c 0057 32 30
c 005a 30 31
c 0069 20 49
c 006a 30 20
c 006b 31 32
c 006e 32 30
c 0071 30 31
c 0234 10 1f
c 0235 be 02
c 0236 00 10
c 0237 4b 3f
c 0238 ed 1c
c 0239 29 12
c 049b 3d 66
c 049c 45 15
c049d 47 73
v
```

**For a quicker response, your questions may also be submitted through RAINBOW's CoCo SIG on Delphi. From the CoCo SIG> prompt, pick Rainbow Magazine Services, then, at the RAINBOW> prompt, type `ASK` for "Ask the Experts" to arrive at the EXPERTS> prompt, where you can select the "Doctor ASCII" online form which has complete instructions.**



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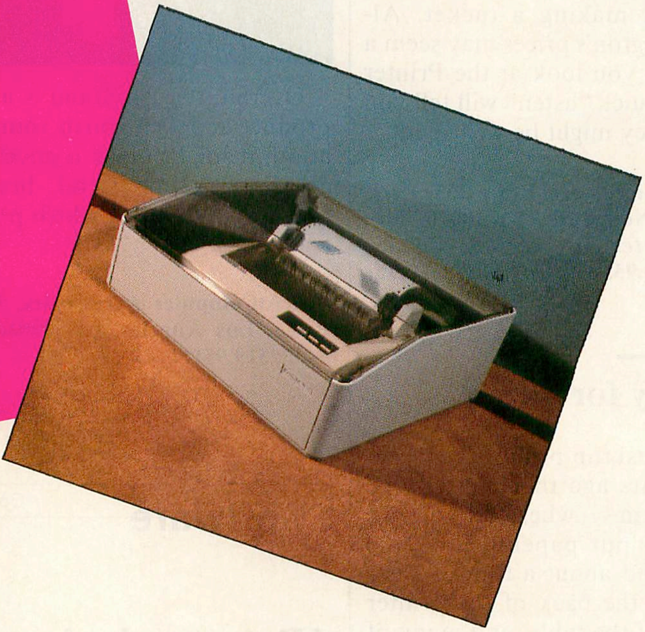


**Accessories**

## Printer Muffler 80 — Quiet at Last

Dot matrix printers are definitely nice to have, what with all the neat things they can do — everything from letter-quality typing to halftone graphics — but they are noisy!

The sound of pins hitting paper is like nothing else on earth, except, perhaps, fingernails on a chalkboard. While we may have gotten used to this sort of racket that may not be true of our spouses, children, parents, roommates, co-workers, etc.

Laser printers are nice, but the high price makes them a dubious choice unless you're doing a lot of printing. Thermal transfer printers are certainly quiet, but they're rather limited in their capabilities and have a habit of finishing off ribbons in a hurry. The one solution left is to put the printer someplace where it won't be heard — into a Kensington Printer Muffler.

The Printer Muffler is a large, gray plastic box lined with foam to absorb sound; the lid is clear plastic to allow you to watch printer operation without opening it. There are two models: The Muffler 80, which we tested, has interior dimensions of 19-by-16¼-by-6 inches and holds most 80-column dot matrix printers, while the Muffler 132 measures 25-by-17-by-8 inches inside and is designed for the smaller wide-carriage printers (it may hold some daisy wheel printers, as well). Both models have slots in the back for paper entry and exit, and slots at the left and right rear for cables.

The Printer Muffler is shipped unassembled, but assembly is no problem; three screws hold each of the four corners together, and when all corners are fastened, the whole assembly is solid. The interesting part is the bottom — there isn't any. The Muffler sits on a table top (or the top of a printer floor stand), and the only thing between the printer and the table is a piece of foam, which has a slot cut out for use with bottom-fed printers on floor stands. The problem here is that the printer Muffler must sit entirely on the table and can't extend past the table top. Since the Printer Muffler is so much larger than the printers it's used with, you may find you no longer have a convenient spot for paper. Kensington's solution to that is a $30 Printer Muffler Stand that forms a base for the Muffler, elevates it above the table and provides space under the Muffler for paper.

What about the noise? Kensington claims that an independent lab measured a sound level on a printer that was seven dB lower than what it produced without the Muffler. Seven dB works out to an attenuation figure of about 75 to 85 percent. While we had no way to confirm the numbers, our listening tests show that the Muffler did make a real difference in noise levels. You still wouldn't want to have the printer in the nursery when the baby's asleep, but at least now you can have it in another room without making a racket. Although Kensington's prices may seem a bit steep when you look at the Printer Muffler, one quick "listen" will tell you that your money might be well spent.

**(Kensington Microware Ltd., 251 Park Avenue South, New York, NY 10010, 800-535-4242; *Printer Muffler 80*, $59.95; *Muffler 132*, $79.95; *Muffler stand*, $29.95)**

## UniStand — Clears Way for Paper

Ever since desktop printers came on the market years ago there's been one nagging problem — where do you put the paper? To put paper behind the printer you need about a foot of clear space between the back of the printer and the back of the table, and many of us don't have it. You might put the paper on the floor and bring it up behind the table, but that tends to require some odd and painful contortions. A printer stand is probably the best answer, and MicroComputer Accessories' UniStand is a good choice.

The UniStand is a deceptively simple device consisting of two "half-stands"; each half fits under one side of the printer, which allows the UniStand to work with printers of any width. I tried it on both an Epson RX-80 and a wide-carriage Okidata Microline 193. The half-stands have a relatively wide footprint, and the whole assembly is quite stable. The printer is supported a few inches above the table, making room for a few hundred sheets of paper underneath, and is tilted forward a few degrees for easier viewing.

The UniStand also includes an "output" paper tray to catch sheets of paper coming out of the printer; it hangs on two hooks on the back of the stands. The tray is the proper width for 80-column printers, but if you use a wide printer you'll find that your wide paper is a bit wider than the tray, causing it to sag at the sides, and your 9½-inch paper will land on the left side of the tray.

Overall, the UniStand is a first-class product and well worth your consideration; it might make a good gift for a computer-using friend, because you don't have to know which printer your friend has!

**(MicroComputer Accessories, 5405 Jandy Place, Los Angeles, CA 90066, 213-301-9400; $19.95)**

**— Ed Ellers**

**Software** CoCo 1, 2 & 3

## *IRA Analysis* — A Wise Investment

In the current era of Reaganomics there are precious few truly excellent tax shelter investment opportunities available in the private sector. The I.R.A. (Independent Retirement Account) stands alone as the most accessible and reasonable choice for the small investor. With the release of *IRA Analysis* 1.1.2, A to Z Unlimited has provided the CoCo Community with a gem of a program.

*IRA* is extremely powerful and useful. From the opening screen graphics to the final printed output, the hallmarks of careful planning and attention to detail are evident. While the printed documentation is scanty (approximately 100 words detailing warranty and update policies), the on-screen help and totally self-prompting nature of the program eliminate the need for any printed documentation. Indeed, with the detailed error trapping that is provided, a career accountant with considerable experience was unable to force a program error.

*IRA Analysis* is very much like a good hammer — an excellent tool for a very particular job. The user is prompted to input marital status, spouse employment, initial deposit, and second year on deposits. The user's current age is entered, together with the anticipated age of account withdrawal, expected interest and the number of times the interest is to be compounded yearly. *IRA* then outputs an abbreviated account total to the screen and directs a professional hard copy of the analysis to the printer. Literally hours of work are reduced to a few minutes.

Independent retirement accounts are subject to a great deal of present and pending legislation. Exceptions to the current contribution limits are encountered when pre-existing accounts are "rolled over" into new, higher yielding accounts. *IRA* provides a Rollover option that allows the program to continue without flagging an error condition. Version 1.1.2 of *IRA* incorporates all current federal regulations regarding maximum contributions per year and the effects of a working or non-working spouse. Anticipating changes in the federal regulations, the authors have stated a policy of current upgrades being made available to registered users for a nominal fee.

Despite the glamorous packaging and excellent error trapping, *IRA* could benefit from some type of disk I/O routine that would allow saves of the calculated results.

*IRA* marks the advent of a trend in CoCo software packaging that may bode well for the future. Upon booting the program, the user is prompted to specify which CoCo the program will be run on, CoCo 1, 2 or 3. *IRA* then loads the proper version, taking full advantage of the enhanced display of the CoCo 3, while providing fully functional versions for the CoCo 1 and 2.

Unfortunately, the authors have also chosen to maintain, and even enhance, another evolving trend — copy protection. *IRA* is furnished on a copy-protected, password-protected disk. A non-functional backup may be created to "refresh" the original disk. The media warranty is quite restrictive: $5 replacement fee for failure within 90 days, $10 if failure occurs after 90 days. The authors apparently have chosen to extend copy protection with a financial penalty for registered users who experience incidental disk or system failures.

While the program is well-conceived

and efficient, the authors might reconsider their position on replacement charges. *IRA* is fairly priced, but, as a single application package, it will be of limited use to the private consumer.

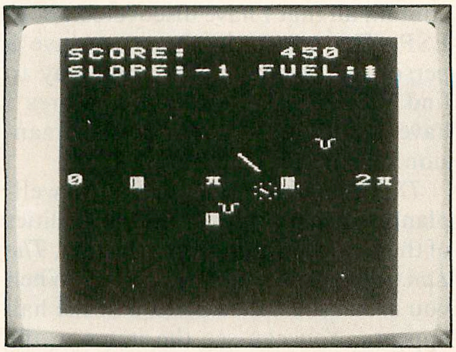
**(A to Z Unlimited, Software Division, 901 Ferndale Blvd., High Point, NC 27260; 919-882-6255, $29.95)**

**— Henry Holzgrefe**

**Software** CoCo 1, 2 & 3

## *Trig Attack* — Math Learning Made Fun

*Trig Attack* is an educational game that helps teach trigonometry and geometry concepts. The program is provided on tape or disk and is copy-protected. It runs on any Extended Color BASIC Computer with a minimum of 16K RAM and a joystick. It also runs on the CoCo 3, but you have to use a TV set or a monitor with composite video input to see the colors. Otherwise, you get a black-and-white picture on an RGB monitor.



After you load the program, a title screen appears along with sound effects. Pressing ENTER allows you to change options, which include screen color and skill level. Pressing the firebutton starts the game.

The game screen displays the score and reserve "rotating slopes," or men. These are used to destroy the Trigs, geometric aliens that travel across the screen in a pattern corresponding to a specified graph or trigonometric function. To destroy the Trigs and earn points, you must align your rotating slope with the Trigs. The Trigs will not be destroyed until your rotating slope matches the Trigs' angle of travel. Pressing the firebutton changes your rotating angle in increments that match those of the Trigs.

You also encounter rotating Trig Slopes that travel along the same path as the Trigs. Contact with these guys results in the loss of one of your rotating slopes. It is also possible to run out of fuel, so you must capture fuel containers on occasion by passing over them with your rotating slope. A fuel gauge is displayed at the top of the screen, so keep an eye on it as well as all of the other action.

While all of this may sound confusing, you will have to play the game in order to appreciate its capabilities. The graphics are good — not great, compared with the capabilities of the CoCo 3, yet typical of CoCo 1 and 2 fare. The action is smooth and fast-paced, and won't leave you bored.

A 10-page instruction booklet defines various trigonometric and geometric terms and provides graphs that illustrate basic concepts. While the program and documentation are not intended to teach these subjects, they do provide a basic approach to help in understanding them. A total of 11 levels of play are provided, and as your skills advance, you encounter Trigs that travel along paths representing sine, cosine, tangent, ellipse, parabola, hyperbola, and logarithmic functions.

*Trig Attack* is basically a shoot-'em-up game, but it is refreshing to see entertainment coupled with a learning experience.

**(Sugar Software, P.O. Box 7446, Hollywood, FL 33081, 305-981-1241; $19.95)**

**— David Gerald**

**Software** CoCo 1, 2 & 3

## *Color File II* — Convenient Filing System

*Color File II* is a filing system for any version of the Color Computer with at least 16K of RAM. Since this program comes on a ROM pack, all you need to do is plug it into the cartridge port on the side of your computer (*before you turn on the computer!*). However, in order to save the files that you are working on, you will need to hook a cassette recorder to your computer.

After the program is running, you can choose one of four screen options: no lowercase, green on black for lowercase, black on green for lowercase, or Tandy's lowercase (only available with the CoCo 3).

If you are using the CoCo 3, you can format the program for use with either a color or black-and-white TV, a monochrome monitor, a color composite monitor, or an RGB monitor. Monochrome and RGB monitors allow two modes of screen resolution, 38- or 80-column. TVs and composite monitors do not allow 80-column screens.

If you want to load an old file, follow the prompts on the screen. If you are going to create a new file, you will be asked for a filename; after choosing one, you advance to the new file screen where you can have files made in one of the preset formats. When you have chosen the file type you would like to work with, you advance to the Create Field Format screen. Exiting this screen takes you to the main menu.

The main menu gives you the choice of seven options. Option 1 lets you do the actual work of creating your file. At the bottom of the screen is a group of eight commands which use the CLEAR key and command number on the CoCo 1 or 2, or the ALT key and command number on the CoCo 3. Although it is not mentioned in the instruction booklet, paging up and down through the records you have created is controlled by the CLEAR key and the left and right arrow keys.

Option 2 allows you to get a hard copy of your records. The first thing to do when using this option is to format the file you want to print. Select the field you want to print by using the CLEAR key and the up or down arrow key. After selecting the field, you must insert a print code for each character you want printed.

Option 3 loads a file from cassette. Option 4 lets you create a new file (if you use this option, you will erase any file that is in the computer's memory). Option 5 saves a file to cassette. Option 6 changes the printer options, lines per page, line width, margins and baud rate, and sets the paper to top of form. Option 7 changes the screen options.

You can also create your own fields. In this way you can add a field, or change or delete any displayed field to customize it to your needs. When you are entering files, you can use the Search option to search for any record that contains your specified criteria. You can also sort records the same way.

This a good program, and it does everything it is advertised to do. I have the original *Color File*, and I like the extra options of this version. I have to say that the instructions are a bare-bones affair. There is nothing in the documentation about how to page up or down, and the two pages of material on setting up the print format are not very clear. But all in all, *Color File II* is convenient and easy to use. I especially like the use of the command keys.

**(Tandy Corporation, 1700 One Tandy Center, Fort Worth, TX 76102, 817-390-3300; $24.95. Available in Radio Shack stores nationwide.)**

**— John H. Appel**

**Software** CoCo 3

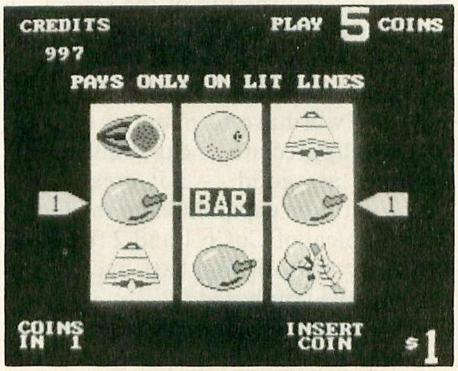
# *Vegas Slots* — Beat the One-Armed Bandits

If you like to gamble with slot machines but don't like the possibility of losing, then *Vegas Slots* is just the thing for you. It allows you to get your hands on these one-armed bandits without putting out the money for plane fare to Las Vegas — and you can stay in your own room for free. And, when you lose all your money, you won't have to check out early and hitchhike home. One thing is for sure — after playing, you will know for certain why these machines are called bandits.

The disk contains seven different slot machine games. You get three one-line multipliers, two three-line pays and two five-line pays. Just like playing the real machines in Vegas, you can choose your odds. Of course, the machines with the lower odds have the lower payoffs. If you want to see what the payoffs are, press P to get a list before you "insert" your coins.

The seven machines include MultiBars, Fruit MultiBars, Melons and Bars, Fruit, Bar 5, Lucky Dollar, and Right-Left/Left-Right. I cannot say that all the machines play exactly like the real slots, but I sure lost a lot of money. The nice thing was that I could keep getting more money and, eventually, a payoff. Still, I sure am glad it was not *my* money I was playing with.

*Vegas Slots* requires a 128K Color Computer 3 with one disk drive. Joysticks are optional, and while a color monitor is not required, you will probably want to use one or a color TV over a monochrome monitor. It does have some colorful screens. The program supports both types of monitors, and when loading, it asks if you are using composite or RGB. The documentation is only one page; it doesn't take a lot of instructions for inserting coins and watching the screen.



**(Tom Mix Software, 4285 Bradford NE, Grand Rapids, MI 49506, 616-957-0444; $34.95 plus $3 S/H)**

**— Dale Shell**

**Software** CoCo 1, 2 & 3

# *The Lansford Mansion* — Discover the Secrets of ESP

*The Lansford Mansion* is a very good Adventure game for the CoCo. For those who aren't familiar with Adventure games, they differ from the arcade-type games, which rely on eye-hand coordination, in that they exercise your brain.

Through the magic of your computer and the program, you become the main character in the story. You are able to enter new and strange places without ever leaving your chair. Your own logic and imagination determine the actions of the hero (you), and guide the story from start to a sometimes untimely finish. You are presented a series of locations, items, characters and events and interact with the story in a number of ways, moving from place to place, becoming familiar with your surroundings, exploring locations and examining articles found.

An important part of Adventure games is puzzle-solving. Encountering a locked door or a ferocious beast blocking your path is a challenge to be conquered by using certain items you find through careful exploration (e.g., a key can open a door, a sword can slay a dragon).

The fun of the game is bypassing these obstacles, finding treasures, avoiding being eaten by exotic creatures, and solving diabolical puzzles.

The program tells you where you are, anything obvious you should know about the situation (the subtleties are for you to discover), and then awaits your response. Instructions are entered via the keyboard

*The Lansford Mansion* scenario is set many, many years ago in a remote country, where a boy named Robert Lansford was born. Soon after his birth, it was obvious that he was no ordinary child. He was extremely smart and interested in many things. Most of all, he was interested in ESP. After becoming rich and famous, he built a mansion where he lived for the rest of his life, working on a strange project. He died at the age of 60 and left a rather strange will.

It reads: "I, Robert Lansford, leave all that I own to the person who can find my personal notes. I have hidden them somewhere in my mansion. These notes contain all that I have discovered about ESP. The secrets in them can give a person great power. The only way to find them is to collect the treasures I have hidden in and around my mansion." Your Adventure begins.

*The Lansford Mansion* is a well-planned game using all the capabilities of the CoCo. In addition to the text, *The Lansford Mansion* has graphics. When you are in the hall, a picture of the hall appears. You can see the items in the room. If you have a speech pack, the Adventure even talks to you!

This program hooks you. The diabolically creative mind of the programmer keeps you at the keyboard for hours, and those hours pass rapidly. As you solve each of the puzzles and advance further into the Adventure, time becomes a relative thing.

Keeping that in mind, I would recommend *The Lansford Mansion.* It is well-designed and takes advantage of the CoCo's ability to give your mind a workout.

**(Diecom Products Inc., 6715 Fifth Line, Milton, Ontario, Canada L9T 2X8, 416-878-8358; $38.95 U.S.; $52.95 CND)**

**— Bruce Rothermel**

**Software** CoCo 3

# *Hi-Res III* — Fancy Screens the Easy Way

*Hi-Res III* is a utility program that enhances the CoCo 3 text display.

After the program is loaded, the user has a multitude of options for text display, accessed with combinations of the CTRL key or CLEAR key followed by other single-key commands.

The default display of the program is 80 columns by 24 lines. This can readily be changed from 14 to 212 characters per line (displays of up to 128 characters are easily read on the CM-8 monitor). Font styles can be changed from regular to italic, bold, underline, double-wide, double-height, etc., with simple keyboard commands. Reverse video is also available, and the white on black text is exceptionally sharp. Other color combinations can be defined with the use of the CoCo 3 palette command (palettes 0 and 1 supported).

In addition to the text variations, a number of other useful functions are implemented. Toggles for blinking/non-blinking cursor, standard/Hi-res display, reverse/normal video, destructive/non-destructive cursor, underline on/off, etc., add to the program's power. Many editing features are included, as well as the ability to "protect" text lines, a particularly powerful feature. A variable speed key-repeat function has also been added.

For ease of use in incorporating the functions into your own programs, all of the keyboard functions can be accessed via simple print statements (e.g. `PRINT CHR$(27);"I"` would turn on italics). Compatibility with existing BASIC programs is good, though complicated mainly by the `PRINT @` statements which, of course, would not position characters the same for different character widths. However, even the simplest of BASIC programs are easily made to have impressive displays.

Documentation is well-written, and due to ease of program use, only a quick scan is needed to begin experimenting with the features of the program. The program is supplied on a single non-protected disk for user convenience.

Cer-Comp and author Bill Vergona have again managed to put together a package which accesses the full power of the CoCo. If you have a high-resolution monitor and CoCo 3, I highly recommend *Hi-Res III*.

**(Cer-Comp, 5566 Ricochet Avenue, Las Vegas, NV 89110, 702-452-0632; $34.95)**

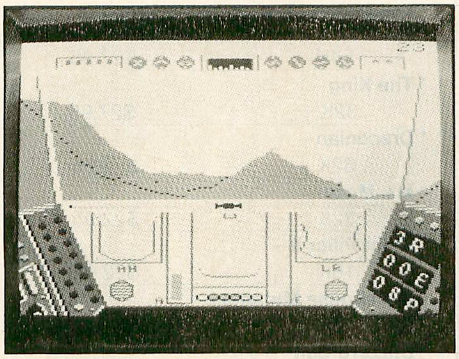
**— Leonard Hyre**

**Software** CoCo 1, 2 & 3 OS-9

# *Rescue on Fractalus* — Bag the Jaggies

In the rush to get software to market for the CoCo 3, we have seen some revised programs, some new programs and some translations from other computers. One such translation is *Rescue on Fractalus* from Epyx Computer Software.

I remember when I walked into my local Radio Shack and saw the amazing Hi-Res game, *Koronis Rift*, also made by Epyx. That program was enough to influence me to buy a CoCo 3. Now that I have one, I jump at the opportunity to buy new programs. *Rescue on Fractalus* is one of the many programs I have bought, and I must say it is one of the best games for the CoCo 3. Although both *Koronis Rift* and *Rescue on Fractalus* have similar graphics, *Rescue on Fractalus* is easier to understand.



"You have just joined an elite Rescue Squadron, flying to the hostile planet Fractalus to confront the ruthless enemy Jaggies head-on. The mission is to rescue Ethercorps pilots shot down and stranded on that brutal planet, and help lead our forces to victory . . . for the merciless Jaggi onslaught must be stopped to preserve the future of the galaxy."

The sound could have been better but the graphics more than make up for it. The game gives a three-dimensional perspective of the landscape out the main window of your Valkyrie Fighter. From time to time, when I was soaring through the vast canyons of Fractalus with the gun emplacements firing down on me and the suicide saucers nearly hitting me, I was reminded of the Tower/Trench sequence from the *Star Wars* arcade game. This inevitable comparison is an example of the sophistication but ease of game play.

The cockpit is equipped with an assortment of gauges not so different from that of most simple flight simulators. A compass and the score are at the top of the screen. On the left panel are gauges for monitoring the thrust level and for warning you of dangerous altitudes.

On the right panel are three lights. The first light indicates that the Dirac Mirror Shield is on. The second light indicates the presence of your mothership. And the last light indicates that the air lock is open.

There are also indicators to show pilot range, the number of enemies destroyed and the number of pilots rescued. The center panel contains a gauge to show the current bank and climb, the altimeter, a targeting scope, an enemy lock-on indicator, an energy-level indicator and a long-range scanner.

The joystick is used for flight and for choosing a skill level. The firebutton is used to launch your ship's Anti-Matter Bubble Torpedoes. It is easier to maintain more stable flight with the use of a deluxe joystick.

There are very few keyboard commands for use outside the initial program. SHIFT-ESC exits the program to OS-9, CTRL-R restarts the game, and the space bar pauses the game. As for the actual game-play keys, the A key opens the air lock to let pilots in; the B key fires the boosters for traveling to the mothership; the L key lands the ship; the S key shuts off the systems; and the "less than" (<) and "greater than" (>) keys decrease and increase thrust. The "greater than" key also acts as a "launch key."

*Rescue on Fractalus* has some surprises in it (watch out for the pilots in green helmets, because they are too eager to meet you). And, if you are like me, you will find yourself so caught up in the action that you'll be dodging from side to side in time with the motion of the ship.

**(Epyx Computer Software; $29.95. Available in Radio Shack stores nationwide.)**

**— Glen Baisley**

# TOM MIX'S MINI-CATALOG

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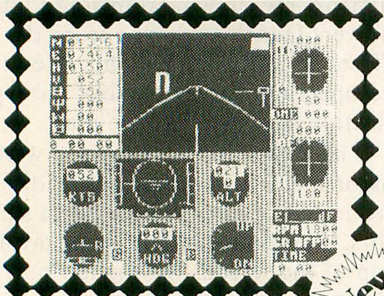

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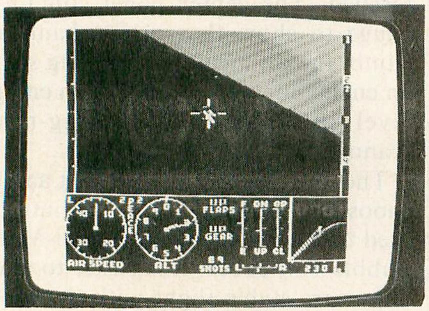

### *P-51 Mustang Attack/Flight Simulation

The ultimate video experience! Link two CoCo's together by cable or modem, and compete against your opponent across the table OR across the country! (Both computers require a copy of this program). The P-51 flight simulator lets you fly this WWII attack fighter in actual combat situations against another player, OR a non combatant computer drone.

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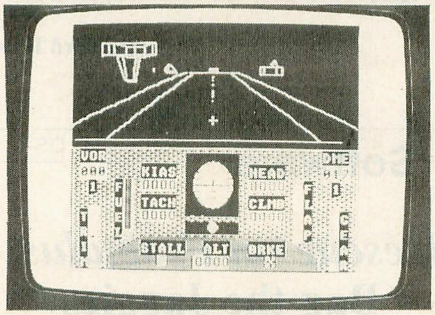

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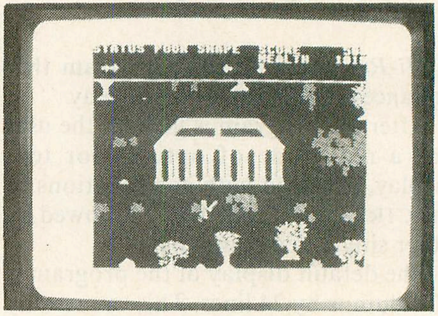

### *Wizard's Den

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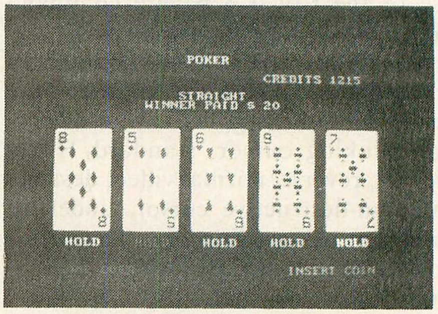

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**Software** CoCo 1, 2 & 3

# *Utility Routines Volume II* — Library Mainstays

*Utility Routines Volume II* is a disk containing several useful utility programs. Following is a short description of each program.

Automatic Error Locator — automatically locates the error in any BASIC program; not just the line number, but the exact error itself.

Basic Search And Replace — allows you to search your BASIC program for a given phrase and replace it with a given phrase.

Calculator — creates a useful calculator for converting Hex and decimal as well as standard mathematical calculations.

Command Maker — allows you to create your own direct commands up to a maximum of 20, but it cannot be used within BASIC programs.

Directory Backup — automatically saves a copy of the disk directory to Track 0. If you have a disk crash, you can recall the lost directory.

DMP Character Set Editor And Printer — designs your own custom character set for your DMP printer.

DMP Superscripts — adds superscripts to your DMP printer.

Enhanced Kill — adds versatility to the BASIC KILL command by allowing the killing of multiple files with only a few keystrokes.

Graphics Compression — Disk BASIC 1.1 users can compress their graphics screens for efficient storage. Instead of a PMODE 3 or 4 picture taking up three granules, you will use a maximum of two. You can also decompress a compressed picture.

Last Command Repeater — lets you display the last typed-in command with two keystrokes.

Message Mover — makes an eye-catching moving billboard.

Multiple Choice Test Designer — creates multiple-choice tests.

New Paint — paints in 65,536 different PAINT combinations of styles and colors. (I didn't count them all.)

ON Reset GOTO — lets you force the computer to GOTO a specified line in your BASIC program. It's really handy if you have to use Reset without losing your data.

Program Clock — not an accurate time piece, but helps keep track of programming time.

Super Command Keys — allows you to enter most ECB BASIC commands or phrases with only two keystrokes.

Super Editing System — use the up/down arrow keys to scroll up and down through your BASIC program and go into the Edit mode by just a press of the CLEAR key.

Super Fast Sort — sorts 100 strings in less than 10 seconds.

All of the programs are easy to use and supported with complete instructions. Most CoCo users will find something useful on this disk.

Another very useful disk of utilities is the *Utilities Bonanza*. It contains the following programs.

40K Disk Basic 1.0 — provides 64K users with 40K of memory instead of the usual 32K. Version 1.1 is also on the disk for use with Disk BASIC 1.1.

Appointment Calendar — keeps track of all your weekly appointments and includes a clock as well. Up to 50 appointments can be scheduled per day.

Basic Line Copy — lets you copy a BASIC line, which is handy if you ever type in a BASIC line with the wrong line number.

Basic Line Stepper — allows you to run your program one instruction at a time, which is handy for debugging programs.

Bill Manager — simplifies the payment of your bills. You can enter up to 50 bills at a time, and it tells you when each one of them is due.

Disk to Tape 1.0 — allows you to copy most BASIC and ML programs from disk and back them up to tape. A version to use with Disk BASIC 1.1 is also included.

DOS Command Enhancer — lets you make up a custom DOS menu disk that utilizes the DOS command if you have it available.

Double Bank — lets you use the upper 32K of your 64K RAM for other BASIC programs along with those in the lower 32K.

Enhanced LList — formats program listings with page number, margin control, perforation skip and other useful features.

Enhanced RAM Disk — creates an "in memory" disk drive capable of storing 28K bytes for subsequent SAVEs and LOADs of BASIC and ML programs.

Expanded BASIC — modifies CoCo's BASIC to give you 10 new features, including addition of an "Are You Sure?" prompt to the NEW command, as well as reset-protection in the 64K RAM mode. It also lets you use the CLEAR key to pause instead of the clumsy SHIFT-@. Other similar handy features are available.

Graphics Typesetter — lets you add lettering to your graphic designs or pictures in two sizes.

Large DMP Dump — a PMODE 3 or 4 graphics screen dump for DMP printers. It's in BASIC, so be patient.

Line Cross-Reference — cross-references all GOTOs and GOSUBs for all lines in a BASIC program.

ML To Data Conversion — converts an ML program in memory to a BASIC program with DATA statements.

Numeric Keypad — turns a portion of your keyboard into a numeric keypad for typing of repetitive numbers, as you do for DATA statements.

ROM Switcher — lets you switch between Disk BASIC, Extended BASIC and Color BASIC.

Super Disk Catalog — a disk organizer program.

Super Tape-To-Disk Copy 1.0 — copies BASIC and ML programs from cassette to disk; Plus, it will automatically relocate programs that load at &H600 so that they are compatible with the disk operating system. It will not copy autostart programs.

Text Screen Dump — a single key activates a screen dump to your printer.

All of these programs come with full documentation on operation and use. Most are very handy and should be helpful to the average CoCo user. You get a lot of programs for the money.

**(Microcom Software, P.O. Box 214, Fairport, NY 14450, 716-223-1477; $29.95 each plus $3 S/H)**

**— David Gerald**

**Software** CoCo 1, 2 & 3

# *LOTZALUK* — Tracks Lottery Drawings

With the hope of getting rich quick, many people now spend a part of each week deciding on what numbers to pick and how many picks to take in state lotteries. It seems that those who regularly play have some type of system for deciding on the set of numbers to play.

There are those who simply pick a *random* set of six numbers and those who spend hours studying past lotteries with the hope of finding the winning combination. For these latter folks, you can now use your CoCo and the program *LOTZALUK* to study past lotteries and compare your choices with the historical data.

*LOTZALUK* requires a 32K CoCo 1 or 2, or a CoCo 3 with disk system and a printer (printer is essential to the program). The program is designed to track the past history of a state lottery as well as maintain a database of user- or computer-generated sets of numbers (picks) for playing the lottery. It provides the standard database functions of data input, change, delete and search.

The program compares a given pick with the historical lottery data and provides a listing of how each pick matches past lottery drawings. There are several options for determining the frequency of drawing each number in the lottery database, for tracing the number of hits that a selected pick would have had for each of the draws in the history database, and for determining which one of the picks had the maximum number of total hits.

*LOTZALUK* comes with an historical database that contains data for the first 22 drawings of the California state lottery. A 17-page manual is provided, which is well-written and clearly describes each function of the program. It ran as described in the manual on my 512K CoCo 3, with no problem. The author claims to have tested *LOTZALUK* with ADOS, OWL DOS and Spectrum DOS and found no problems. However, he did note that the program did not run on ADOS-3 and C DOS.

Personally, I find the program's protection scheme particularly irritating. The user must make a backup copy, which is then saved should the master become unusable (the backup is used to restore the master). In other words, the master disk is used as the working disk, with the lottery and pick data also recorded on it. In my opinion, one should never write on a master disk but rather use a backup disk. I am completely in favor of software protection, but I do not like this approach. In fairness to the author, I should note that the program is delivered on a "flippy" (the program is on both sides of the disk). This alleviates some of my fears, but I would prefer the method of making a backup that cannot be copied. That way, the master can be safely stored to be used only when needed.

The program provides the capability to track individual picks and study these picks versus the past history of lottery drawings. For many lottery players who take the lottery very seriously, *LOTZALUK* provides a tool for study of the lottery. However, as my statistician friends tell me, each lottery is an independent event, and there is no increased probability for a given set of numbers to be drawn based on past lottery drawings.

**(William G. Brigance, Sr., 1001 Fairweather Drive, Sacramento, CA 95833, 916-927-6062; $29.95: First product review for this company appearing in THE RAINBOW.)**

**— Donald Dollberg**

**Software** CoCo 1, 2 & 3

# *Phonebook* — Telephone Book Application For Your CoCo

If you are new to computing and looking for a simple telephone book application for your Color Computer, you may be interested in this program by Custom Software.

*Phonebook* is a BASIC program for CoCos requiring 16K and a disk drive. The program is not copy-protected, is fully warranted, and faulty copies will be replaced for return postage. Documentation consists of two pages of easy-to-understand instructions.

The program is menu-driven and is very simple to use. After running `"PHONEBOOK"`, you are presented with the main menu options.

Lookup Name/Number lets you type in a search string. Type in as much of either the name or phone number as you can remember, and the program searches the disk and displays the information on the screen.

Edit Name/Number lets you enter the search string or, if it's already on the screen, modify it.

Add Name/Number lets you create your phonebook file. The name is limited to 25 characters and the phone number to seven digits. Instructions are provided to change the area code and exchange code to default. This eliminates the need to type in area or exchange codes on repetitive entries unless they are different. When you are finished, type `END` at any prompt to return to the main menu.

Select End The Program when you are ready to quit. Using BREAK might result in loss of data.

Two other options are provided that can be selected from the main menu. Pressing N lets you continue to the (n)ext occurrence of the search string. This is useful if you are trying to locate the phone number of a particular common name that might be duplicated in the phonebook. You can also press L to go back to the (l)ast occurrence.

*Phonebook* does not support a printer option. This would greatly enhance the program because the user could print out a listing of names and phone numbers for use as a handy reference. As is, this is a good program that could be made better with printer capability.

**(Custom Software, Box 42, Long Lane, MO 65590, 417-345-8163; $10 plus $1.50 S/H: First product review for this company appearing in THE RAINBOW.)**

**— Jerry Semones**

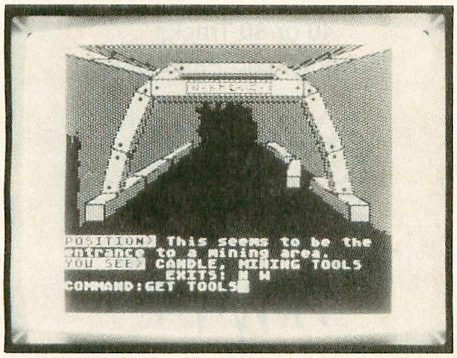
**Software** CoCo 1, 2 & 3

# *Hall of the King III* — The Earthstone Revealed

*Hall of the King III* is the conclusion of the three-part epic saga *Hall of the King*. At last you can conquer the very heart of Firrhest, the mountain home of the Dwarves. *Hall of the King III* is extremely well-constructed, extensive and complex. While the standard command inputs are used ("East," "drop crowbar," etc.), this is a sophisticated Adventure, and I do not recommend it for the inexperienced or faint of heart.

Author Glen R. Dahlgren is in his finest adventuring form, with his usual logic problems and impossible quandaries resolved by straightforward solutions. This is serious stuff, folks. If I were really going into a cave or dungeon, I would want Glen with me.

*Hall of the King III* is not dependent on previous playing of the two earlier Adventures. However, combined, the three Adventures do make an awesome trilogy. As usual, the graphics in the *Hall of the King III* are dramatic, detailed and excellent. The graphics are so good that you get a real feel for your surroundings, particularly if you (ahem!) die in the course of the Adventure. If you are prone to accidents, I recommend regularly exercising the save and load options of the Adventure. They can be used anywhere, and the life you save may be your own. Like other Prickly-Pear software, this program can be backed up and is unconditionally guaranteed to run.



```
POSITION> This seems to be the
entrance to a mining area.
YOU SEE> CANDLE, MINING TOOLS
        EXITS: N W
COMMAND:GET TOOLS
```

The biggest problem I ran into was a couple of spelling errors in descriptions of places or things. Other than that, the Adventure ran smoothly. A note to CoCo 3 owners with an RGB monitor: You are going to have a monochrome display unless you set the palette registers (`palette` *x*,*y*) where *x* and *y* are numbers like 10 and 13. Another possibility is to use a color patch program from THE RAINBOW or one that is commercially available. Colors notwithstanding, the program runs fine on the CoCo 3. However, because of its artifacted `PMODE 4` colors, with a CoCo or a CoCo 2 you may have to press RESET a long time to get the color border blue. Beware, CoCo 3 users! If you press RESET on the CoCo 3, the program crashes and you have to start over!

The documentation that accompanies *Hall of the King III* is quite complete, explaining background, the command structure, and how to load the program and run it. The program is set up for only one drive, and that is the only way it can be played. There is only one disk swap, and it is easily handled.

Like its predecessors, this two-disk Adventure is going to take a good long time to solve for all but the most seasoned adventurers. Budget your time accordingly. The animated graphics make a very good presentation and must be scanned for occasional clues not in the text descriptions, so keep your eyes open!

Now, having bribed the mighty sorceress Chintis into supplying me with critical secret information, and having survived the rigors of what I can only call the Swiss cheese maze, I have but to pass the evil Salamander and the Earthstone will be mine.

**(Prickly-Pear Software, 213 La Mirada, El Paso, TX 79932, 915-584-7784; $39.95)**

**— Jeffrey S. Parker**

Accessory CoCo 1, 2 & 3

# CoCo Keyboard Extender Cable — Clutter Ender

For over five years I have endured the standard plight of the CoCoist. The add-on devices connected to my CoCo were quickly outgrowing my computer desk. But all that ended when I received the CoCo Keyboard Extender.

The Keyboard Extender is simply a cable that connects a standard CoCo keyboard and the CoCo itself. It is designed to work on any CoCo (1, 2 or 3) that uses a Mylar cable to hook the keyboard to the main circuit board. The cable I received from Spectrum Projects is a 20-conductor shielded cable which is about 9 feet long, though the length may vary anywhere from 6 to 9 feet. On either end of the cable is a special connector designed to make installation a snap.

In designing the cable, Marty Goodman realized the average user might have a little trouble "jury-rigging" a connector for the CoCo keyboard, which has a thin, flexible Mylar cable. Therefore, he laid out a circuit for his connector system on a very thin printed-circuit board. This board easily plugs into the keyboard socket on the CoCo. The connector on the other end accepts the Mylar cable from the keyboard. The system also allows for "dual" control. In other words, the connector which plugs into the CoCo circuit board has an extra socket that lets you install the original keyboard in the CoCo. With this design, you can use either the remote keyboard or the one mounted to the main unit.

Installation of the Keyboard Extender is relatively simple. Just open the CoCo and carefully remove the keyboard cable from its socket. Plug the extender cable in and then plug the old keyboard (or a new one if you want to use two keyboards) into the other end of the cable. What you need to be most careful about is making sure the cable ends are immobilized. You will need to provide some sort of strain relief to prevent damage to any of the connectors.

A handy feature of the cable is that the keyboard uses only 15 of the 20 conductors. With a little care and some knowledge of electronics, the average tinkerer can cook up several uses for these extra conductors, such as a power-on indicator and a remote reset button. Many such ideas are given in the instructions that accompany the extender cable.

The instructions accompanying the Keyboard Extender were more than complete. Several suggestions were offered on how to provide strain relief for the cable. Time is taken to explain some of the background information, which makes installation even easier. There are also ideas for how to construct a case for your new external keyboard.

I think the Keyboard Extender is an excellent product. Even if you have no knowledge of electronics, the cable is easy to install. Best of all, it will put an end to that seemingly interminable mess on your computer desk.

**(Spectrum Projects Inc., P.O. Box 264, Howard Beach, NY 11414, 718-835-1344; $39.95; with external CoCo 2 keyboard, $49.95 plus $3 S/H)**

**— Cray Augsburg**

Software CoCo 1, 2 & 3

# *The Third Rainbow Book of Adventures* — A Trip to Adventure

Next time you're interested in booking a trip to adventure, a book is exactly what you should consider — *The Third Rainbow Book of Adventures.* On your tour, you'll stop at 16 BASIC Adventures from THE RAINBOW's last contest. But the best news of all is that each Adventure costs only 75 cents.

Of course, as with most budget operations, there is a catch. In this case it's the typing you'll have to do. *The Third Rainbow Book of Adventures* comes complete with 19 program listings for 16 Adventures, plus descriptions about the

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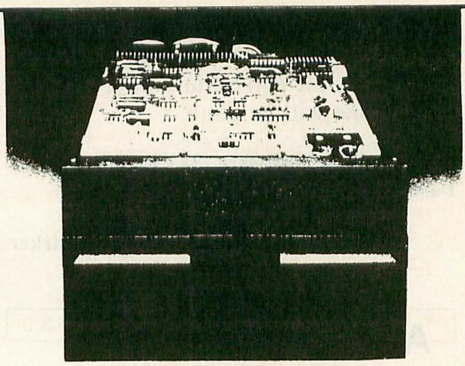

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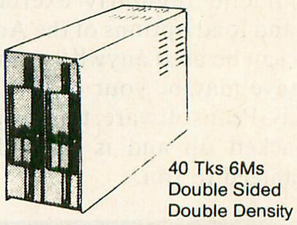

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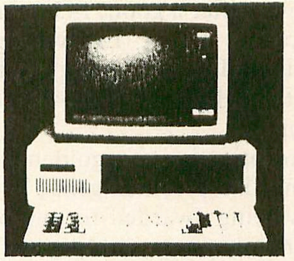

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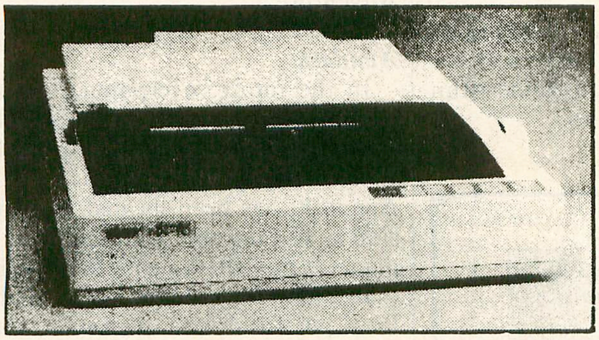

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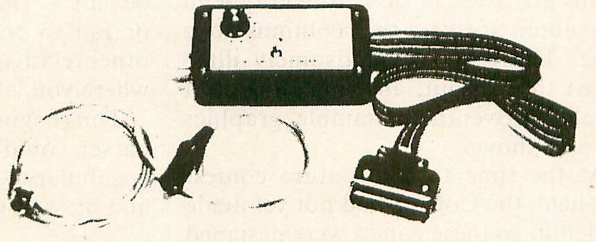

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games' scenarios and loading instructions. To take advantage of the budget rate, you'll have to type in the Adventures before playing them. This is not quite as bad as it seems, because by typing in the various Adventures, you pick up the programming techniques used by the authors.

However, for those who would rather go first class, or who prefer playing to typing, RAINBOW also offers all the programs on disk or cassette. (You still need the book for game and loading instructions.) If you plan on playing many of the Adventures, I recommend that you spend the extra money to get both the book and the disk or cassette. You have all the advantages of the book, plus you can start playing right away, without the "adventure" of keying in the listings. Either with or without disk, though, this package is a real bargain!

The book itself is nicely done. Programs are listed in easy-to-read type in 32-column format, two columns to a page. The book is handsomely illustrated throughout, and, in the case of graphic Adventures, sample graphics are also shown.

At the time the Adventure contest was held, the CoCo 3 had not yet made its debut; so these games were designed for the CoCo 1 and 2, but all of them ran perfectly on my CoCo 3. Now that the CoCo 3 is here, Adventuring should be even more exciting, for 40- or 80-column text that can easily be combined with fantastic color graphics makes Adventure designing and playing even better. And if a mouse- or joystick-driven Adventure is what you seek, the Tandy Hi-Res Interface gives you control over each element on the screen.

The following describes each Adventure:

### *Escape*

You have entered Ludlow Manor in search of adventure, but once inside one of the rooms, the door closes behind you. Can you escape in time?

*Escape* works in 16K and is a simple graphics-oriented Adventure. All it requires is pointing the cursor via joystick or mouse to the object you would like to use/examine and pressing the button. It took approximately five minutes to solve. It is cute for young children or those unfamiliar with Adventures, but for anyone with Adventure experience, it's too easy to bother typing in.

### *The Amulet*

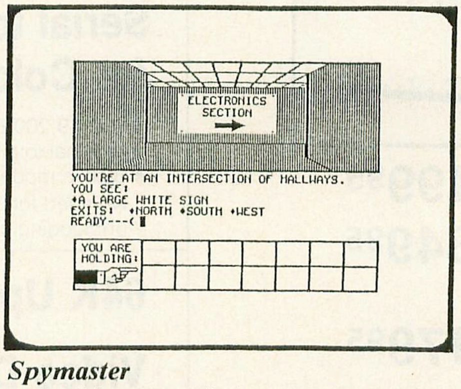
Your great-aunt Mathilda recently passed away after a good, 143-year stay on the planet Earth. Everything she owned, including her body, is being donated to medical research — with one exception.

The exception is a rare golden amulet containing five precious gems. This, it seems, is being awarded to one of the family members, possibly you! You listen as the will is read. In it, Aunt Mathilda states that the amulet actually has powers to protect the wearer against evil, danger, and disease, and will add an extra 100 years to the wearer's life.

But obtaining this fabulous amulet will not be easy, for Aunt Mathilda has hidden the individual stones in different parts of her mansion. The would-be heirs are to draw lots and take turns searching the mansion and grounds in an attempt to find these pieces.

Miraculously, you draw the first chance to search the mansion! But beware — should you leave the grounds or fail to complete your mission, the other relatives will be waiting to pick up where you left off.

Thus begins *The Amulet*. The game's parser could use some work, and the vocabulary is small; but this game is fun and has some good puzzles.



```
YOU'RE AT AN INTERSECTION OF HALLWAYS.
YOU SEE:
♦A LARGE WHITE SIGN
EXITS:  ♦NORTH ♦SOUTH ♦WEST
READY---(█
```

### *Spymaster*

A shipment of short-range nuclear missiles has mysteriously been stolen! Using high-tech detection methods, the Air Force has tracked them down to Death Valley, Arizona. But what are they doing there, and what are the motives of those who have stolen them?

To reduce the risk of catastrophe, you, Agent 27, have been selected to enter the storage base where they are being held. Alone.

When you finally get in, you discover, to your horror, that the missiles are aimed and ready to launch. You realize that you must find a way of stopping these terrorists yourself, for there is no time to get out and report. That's when you get hit over the head. When you regain consciousness, you find yourself in a small, empty room. Can you get out and complete your mission? Only if you are a true Spymaster.

*Spymaster* features nice graphics and a good interface. It won't work with a disk system, but if you have a cassette, I highly recommend it.

### *Ghost Town*

The quest for gold killed more than a few men during the Gold Rush, and it may do the same to you if you're not careful. A tale of buried gold in an old ghost town has sent you scurrying through the desert to reach Amargosa Valley. Should you survive the desert, there are sure to be more surprises once you get there. Can you stay alive and complete your quest, or will you end up like the poor fellow who buried the gold?

If you have only 16K, this is my recommended pick for you. While it counts unrecognized moves in your move total (often causing one to die of thirst in the desert), it is a fun text Adventure.

### *Aandark*

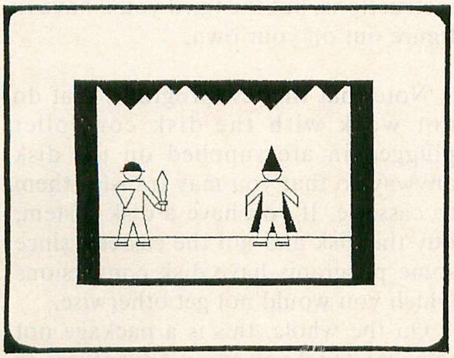
In the future, overpopulation is all too real a problem on Earth. Searching space for inhabitable planets has long been a top goal. One such planet, Aandark, has been located. Your mission is to map out a quadrant of this planet, a mission that may be easier said than done, for there are wild animals, large pits filled with quicksand, sludgy swamps that may hinder you, and decoys that can lead you off track. Should you be able to return home, you will be judged on how complete your map is.

*Aandark* has some nice features, including a graphics map that shows where you have been. It's fun to play, and while it's not tremendously difficult, having to make a complete map makes the task harder.

### *Johnny Zero*

The Button, International President in the year 2091 has been kidnapped! As Agent Johnny Zero, a genetic robot, it is up to you to stop his kidnappers before they execute The Button on International TV and destroy his reign of peace. Gangsters Agent Orange, The Pencil, The Hammer and Agent Spade are suspected as having had a hand in this matter. Can you do it, or will terrorists rule the World Government?

*Johnny Zero* is a simple graphics Adventure. All you have to do is enter a direction (N, S, E, W) or answer Yes or No questions. It's fun to explore, though, and might be good for first-timers or children. While easy to solve, the game is random, so you can play it more than once.



### The Sword and The Sorcerer

This is a four-part graphics Adventure that is moderately difficult. As apprentice to the Wizard, you have learned many of his secrets. But now he is gone, and it is up to you to defeat the evil Sorcerer who has threatened the village of Ling Shai with his dark powers. The Wizard had managed, during his lifetime, to fend off the sorcerer, but never to defeat him. Now that the Wizard is gone, what chance do you have?

Part I, In Search of the Ring, begins in the castle of the Sorcerer. You must find the ring called Equinox, which the Wizard had used.

The Quest for Excalibir, Part II, starts in the same room where Part I left off. With the ring in hand, you must now locate the sword Excalibir.

In Part III, your final quest before meeting the Sorcerer is finding the Shield of Darkness. Both objects found in the previous parts may help you.

Finally, in Part IV, The Final Battle, you must defeat the Sorcerer by gaining energy points using the weapons gathered in the first three Adventures.

### An Actor's Nightmare

Just when your big break as an actor comes and you are invited to perform in front of the Queen's Royal Theatre, tragedy strikes. Your understudy slips you a sleeping pill, and you awake just 10 minutes before the curtain is supposed to rise. To make matters worse, your identification is missing, and, being a relatively unknown actor, no one is likely to believe that you are the gent who is supposed to appear on stage. Can you sneak into the theatre, find everything you need (including the stage, since you have no idea where anything is in this theater), and get your understudy off the stage before the curtain rises?

What a long ten minutes it can be, though. There are so many empty rooms to find your way through. *An Actor's Nightmare* is a text Adventure of medium difficulty, but the time limit makes the game harder.

### The Time Machine

Just when it was thought to be an impossibility, you perfect a time machine about the size of a wristwatch. Or, at least you think you've perfected it. You take just a little trip to confirm it.

But, to your horror, you discover that a flaw in your machine has created a dramatic effect on three historical events. Repairing the machine, you realize that you must return and correct the past — before it catches up with you and destroys the present as you know it.

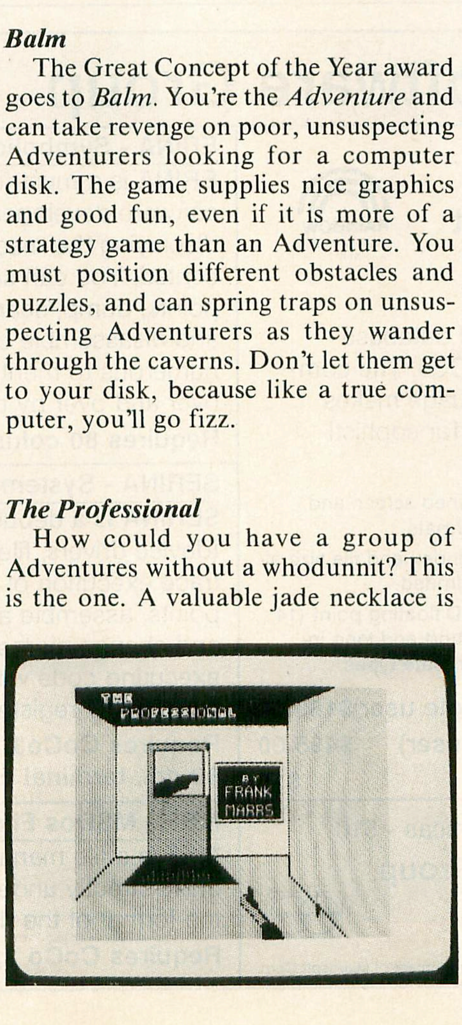
This is a rich, challenging and fun text Adventure. It can be frustrating at times, but that's all part of the game. It even has a disk or tape save feature.

### Balm

The Great Concept of the Year award goes to *Balm*. You're the *Adventure* and can take revenge on poor, unsuspecting Adventurers looking for a computer disk. The game supplies nice graphics and good fun, even if it is more of a strategy game than an Adventure. You must position different obstacles and puzzles, and can spring traps on unsuspecting Adventurers as they wander through the caverns. Don't let them get to your disk, because like a true computer, you'll go fizz.

### The Professional

How could you have a group of Adventures without a whodunnit? This is the one. A valuable jade necklace is reported missing by Claudine Huntsdale, and she has hired you, The Professional, to track down the guilty party. You'll have to interrogate suspects and brave perils in order to secure the treasure — and your $20,000 bonus. A fun Adventure if you like mystery.



### Time Travellers

That scientist you met at the last RAINBOWfest just gave you a call. When you arrive at his house, you discover that he has built a Time Machine. At first you think he's off his rocker just a bit, but when he disappears in it and returns with a dinosaur egg, you have to believe.

Join him on fantastic journeys in his time machine. In *Time Travellers* you visit the age of the dinosaurs, King Arthur's Court, El Dorado, Ancient Rome, Sherlock Holmes' England, the Roaring '20s, and even the future. What treasures can you dig up in these time periods?

*Time Travellers* is worth trying if you have it on disk. It's moderately easy to play, but achieving a high score isn't nearly as easy as it looks!

### Evil Crypt

The *Evil Crypt* is a good graphic exploration game, made more difficult because you can see only the immediate area around you. The Crypt is filled with goblins, pits, space invaders, keys, traps, and everything else your mother told you to stay away from. You move around via the arrow keys instead of typing in commands, and you can find and use potions, a chest filled with spells, a sword, a key and bow and arrow. You'll need all of these things, as well as your wits, to escape the *Evil Crypt*. Trees, walls, stairs, rocks, pits, fire, graves, spacemen, and much more are all represented graphically by symbols, which are listed on a help page.

There are three levels of a cryptic maze to wind your way through in the *Evil Crypt*: Doldrums, Catacombs, and Dungeons. Making it through each is not easy, but sitting safe and sound in your computer room is great fun!

### Cleopatra's Pyramid

Ah, the dangers of boasting. After turning a routine mission to locate a missing diamond into a story that would have made Indiana Jones cringe, you've become quite a hero. Sure, the fantasy is fine — until a short, stocky, gray-haired man approaches you in the local pub during one of your bloodcurdling tales about how you snatched the diamond right out from under the noses of 200 angry tribesmen.

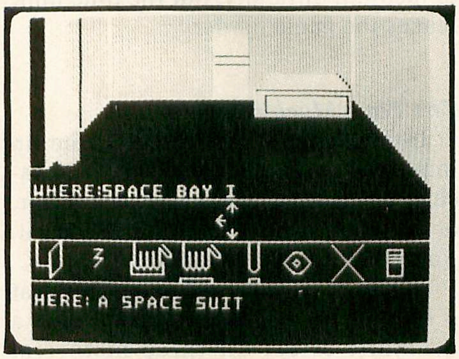
The gentleman insists he has located the pyramid of Cleopatra, filled with beautiful treasures. Urged on by multidigit figures of money dancing in your head, and unwilling to back down from your boasting, you accept the mission to travel deep into the jungle to collect the 25 treasures from this pyramid. But time presses: You have a mere five days to accomplish your mission.

*Cleopatra's Pyramid* doesn't work on disk, but try this gem if you have a cassette.

### *Iconia*

For the visually oriented, here's a game not only with graphics, but with Icons. Want to take something? Point to the picture of a hand grabbing an object, a nice perspective if you've overdosed on literature.

You must recover the ship *Iconia*, adrift in space near Jupiter. Rumor has it that Vade Mowban, the astronaut and scientist who was aboard that ship, was drawn inexplicably to a dark cube which was orbiting the planet. It seems he just left his spaceship and went, unarmed, in a life raft towards the cube. He's never been seen again. Other strange happenings, such as horrendous-looking creatures exploding from globes and malfunctioning computers, have been reported near the black cube. What's going on here? And can you return the *Iconia* safely to Earth?



WHERE:SPACE BAY I

HERE: A SPACE SUIT

### *Escape of Embroilment*

A fun game about a fun house and your not-so-fun attempts to escape really un-fun monsters and the never-fun game of Thermonuclear War. Disk users won't have quite as much fun, though, as it works only from cassette.

If you survive the cassette load, you're in for bigger challenges in the fun house of Embroilment. There's only one exit from this place, and you'll have to wind your way through ghosts, ghouls (who, by the way, can slime you), and three video games designed to challenge the player. Two of them come with instructions, but the third you'll have to figure out on your own.

Note that the few programs that do not work with the disk controller plugged in are supplied on the disk anyway so that you may transfer them to cassette. If you have a disk system, buy the disk and not the cassette since some programs have disk conversions which you would not get otherwise.

On the whole, this is a package not to be missed if you enjoy Adventures or are interested in trying them out, for it offers an excellent value. You can also pick up hints for programming on your own, and it won't bust your budget.

**(Falsoft, Inc., P.O. Box 385, 9509 U.S. Highway 42, Prospect, KY 40059, 502-228-4492; Book (required), $11.95; 2 Disk Set, $14.95; Cassette, $9.95 plus $1.50 S/H)**

**— Eric W. Tilenius**

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**Requires 80 column display, OS9 L1/2 $69.00**

**SERINA - System Mode Debugger for OS9 L2**

SERINA is a debugger for OS9 system modules (device drivers, file managers, etc.). It allows you to trace execution of any system module, set break points, assemble and disassemble code and examine and change memory. There are special provisions for executing code with critical timing loops and for accessing I/O registers. A must for system programmers.

**Requires CoCo3, OS9 L2, $139.00**
**80 col. terminal connected to /T1 or /T2**

**MSF - MSDos File Manager for CoCo 3/OS9 Level 2**

MSF is a file manager which allows you to use MSDos disks directly under OS9. You don't have to change the format of the data before using it!

**Requires CoCo 3, OS9 L2, SDISK3 driver $45.00**

# Received and Certified

*The following products have recently been received by THE RAINBOW, examined by our magazine staff and issued the* Rainbow Seal of Certification, *your assurance that we have seen the product and have ascertained that it is what it purports to be.*

**Auto Dim**, a hardware product designed to automatically darken the television, video or RGB monitor within six minutes after the last keyboard key or joystick button is pressed. Once installed, it works automatically; there is no software to load and execute. For the CoCo 3. *Lucas Industries 2000, 14720 Cedar Street NE, Alliance, OH 44601, (216) 823-4221; $29.*

**Backup Lightning 512K**, a disk duplicating program developed by ColorVenture that lets you use all drives for making copies. For the CoCo 3. *Performance Peripherals, 11432 Pena Way, Miro Loma, CA 91752, (714) 681-7222; $19.95.*

**Business Bankbook +3**, a system that replaces your manual check register and prints your checks. You can print your check register, monthly and year-to-date summary of accounts, sort by account numbers, and list outstanding checks. For the CoCo 1, 2 and 3. *Sunrise Software, 8901 NW 26 Street, Sunrise, FL 33322, (800) 628-2828; $19.95.*

**CoCo 3 Turbo RAM Board**, a 512K upgrade for the CoCo 3. Fully tested and complete with memory tester software. For the CoCo 3. *Performance Peripherals, 11432 Pena Way, Mira Loma, CA 91752, (714) 681-3007; $79.95.*

**CoCo Keyboard Extender Cable**, a cable that lets you extend the CoCo 2 or 3 keyboard, or add an external keyboard to the CoCo 2. For the CoCo 2 and 3. *Spectrum Projects Inc., P.O. Box 264, Howard Beach, NY 11414, (718) 835-1344; $39.95; keyboard and cable for CoCo 2, $49.95 plus $3 S/H.*

**ColorMath**, a 16K educational program for ages 6 through 14. Children receive skill-building lessons in addition, subtraction, multiplication and division. For the CoCo 1, 2 and 3. *Tandy Corporation, $19.95. Available in Radio Shack stores nationwide.*

◆ **Computer Stationery**, continuous-feed computer paper bordered with whimsical designs including teddy bears, sail boats, butterflies and flowers. A Christmas line includes holly and geese. *Computer Creations, P.O. Box 3744, Long Beach, CA 90803, (213) 434-2655; $10 per package of 100 sheets.*

◆ **Disk Filer**, a 64K machine language program that files the programs on your disks. For the CoCo 1, 2 and 3. *COLORado Software, P.O. Box 84, Chimney Rock, CO 81127, (303) 731-4208; $15.*

**FLIGHTSIM I**, a 64K Simulation that lets you learn the basics in instrument recognition, manual control of ailerons (pitch and roll), compass readings and more. For the CoCo 1, 2 and 3. *Tandy Corporation, $24.95. Available in Radio Shack stores nationwide.*

**Hi-Res Joystick Utility Software Bonanza**, utility programs developed by ColorVenture that let you get 640-by-640 mouse and joystick resolution from BASIC. Or run both *CoCo Max 2* and *MaxEdit* on the CoCo 3 without the CoCoMax cartridge and get a 256-by-192 screen. For the CoCo 3. *Spectrum Projects Inc., P.O. Box 264, Howard Beach, NY 11414, (718) 835-1344; $24.95 plus $3 S/H.*

◆ **Kung-Fu Dude**, a 64K arcade game that includes graphics and sound effects. Destroy your opponents and evade obstacles as you try to reach your ultimate objective. For the CoCo 1, 2 and 3. *Sundog Systems, 21 Edinburg Drive, Pittsburgh, PA 15235, (412) 372-5674; $24.95.*

**Pal Upgrade**, a chip that allows your gray or white Multi-Pak (26-3024) to work with your CoCo 3. *Performance Peripherals, 11432 Pena Way, Mira Loma, CA 91752, (714) 681-3007; $9.95.*

**Serina**, a tool for debugging and developing system programs under 6809/OS-9 Level II. It includes a mini-assembler and disassembler for the 6809 as well as tracing and debugging commands. For the CoCo 3 and requires OS-9 Level II. *Clearbrook Software Group, P.O. Box 8000-499, Sumas, WA 98295, (604) 853-9118; $139.*

**Try-O-Menu**, a utility program that reads the CoCo directory and displays a menu from which programs can be loaded and executed with one key. For the CoCo 1, 2 and 3. *Try-O-Byte, 1008 Alton Circle, Florence, SC 29501, (803) 662-9500; $19.99 plus $3 S/H.*

**Video Cards & Keno**, a 128K package that includes Video Poker, Joker's Wild Poker, Blackjack and Keno. Try your luck against the CoCo with these games of skill and chance. For the CoCo 3. *Tom Mix Software, 4285 Bradford NE, Grand Rapids, MI 49506, (616) 957-0444; $29.95 plus $3 S/H.*

**Wizard's Den**, a 64K graphics Adventure. Your goal is to recover the Gem of Damocles, which was stolen by the Evil Wizard and hidden in his den. Beware the wizard's magic as you fight your way through eight levels of mazes. For the CoCo 1, 2 and 3. *Tom Mix Software, 4285 Bradford NE, Grand Rapids, MI 49506, (616) 957-0444; $22.95 plus $3 S/H.*

◆ **First product received from this company**

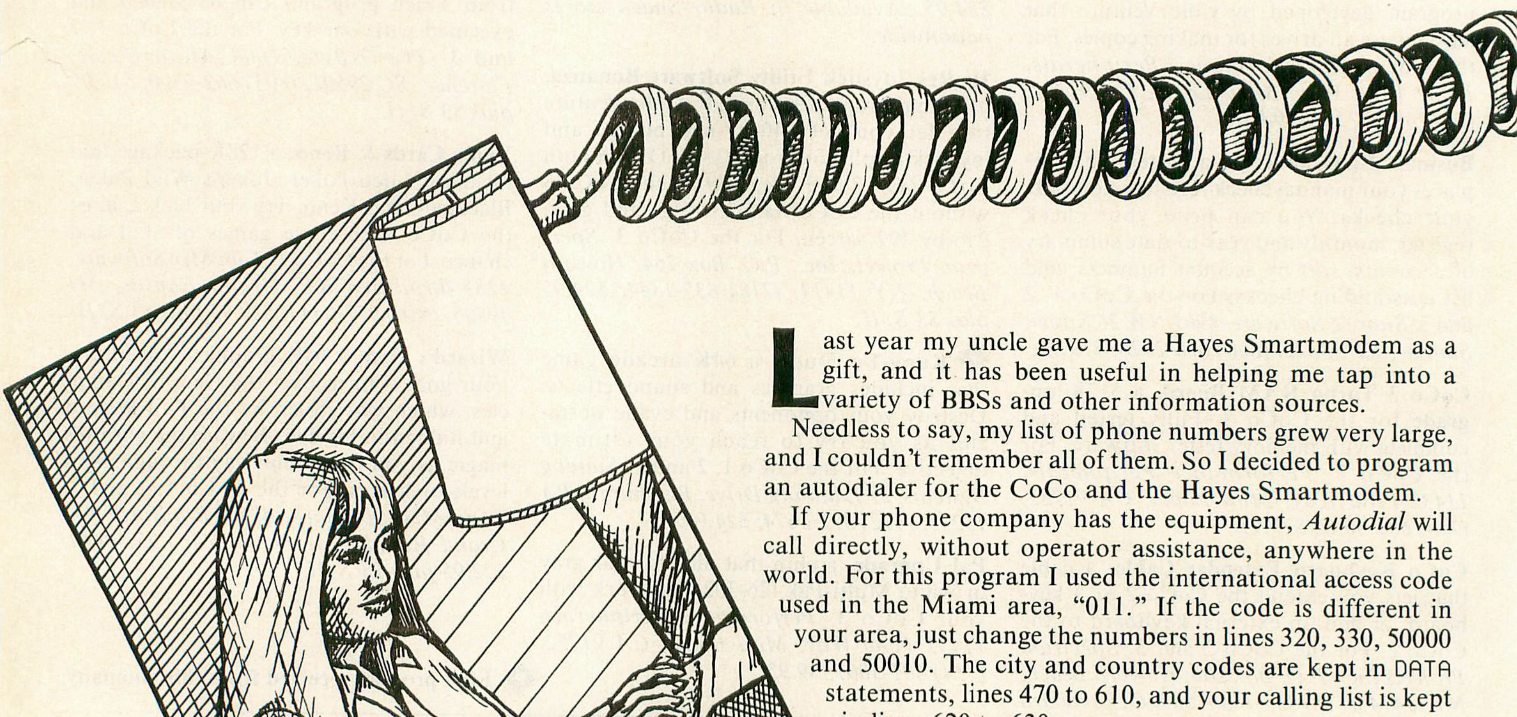
The *Seal of Certification* program is open to all manufacturers of products for the Tandy Color Computer, regardless of whether they advertise in THE RAINBOW.

By awarding a *Seal*, the magazine certifies the product does *exist* — that we have examined it and have a sample copy — but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW reviewers for evaluation.

**— Judi Hutchinson**

# *Autodial* Reaches Out Across the Miles

## By Sean Bossinger



Last year my uncle gave me a Hayes Smartmodem as a gift, and it has been useful in helping me tap into a variety of BBSs and other information sources.

Needless to say, my list of phone numbers grew very large, and I couldn't remember all of them. So I decided to program an autodialer for the CoCo and the Hayes Smartmodem.

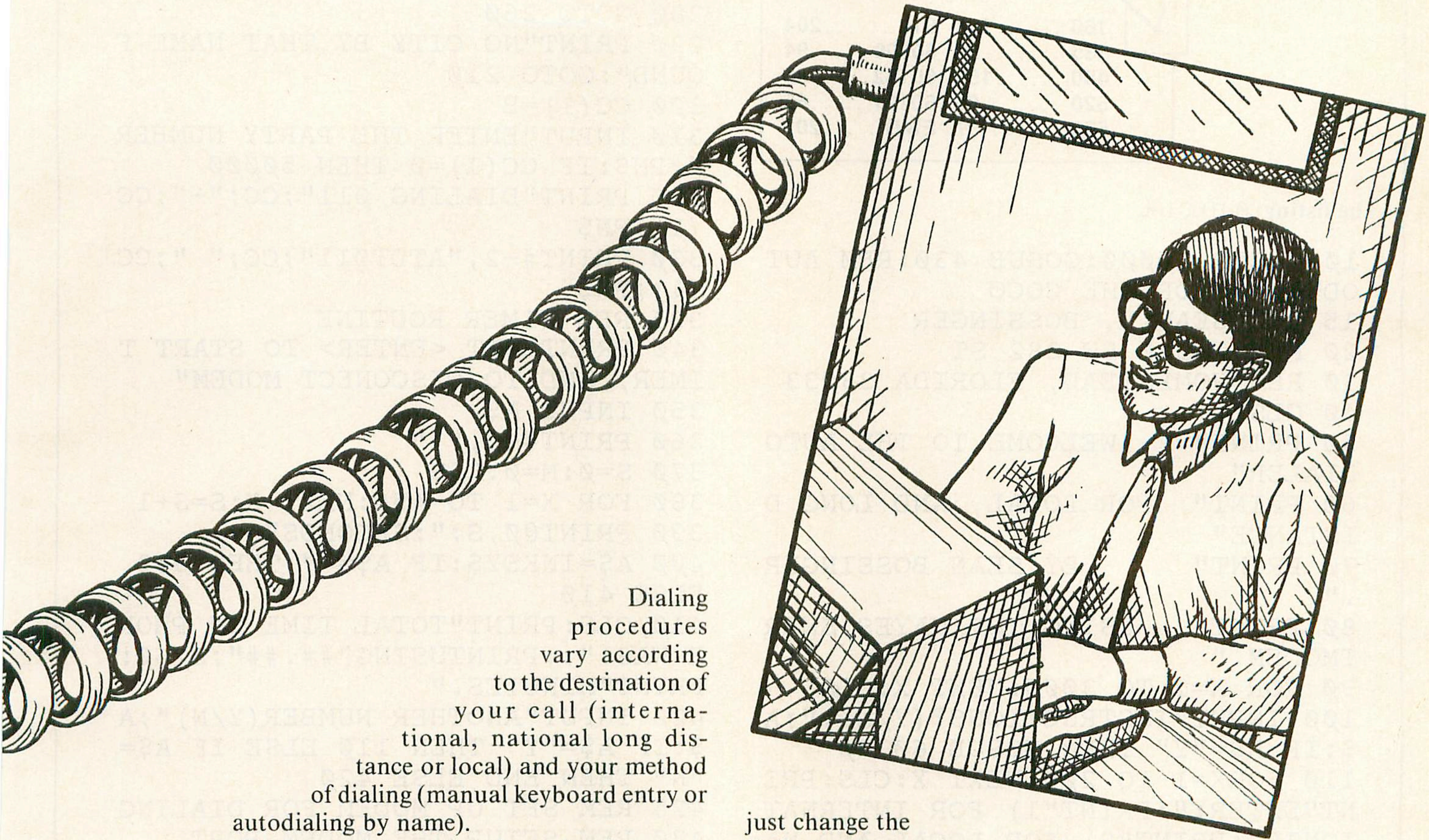
If your phone company has the equipment, *Autodial* will call directly, without operator assistance, anywhere in the world. For this program I used the international access code used in the Miami area, "011." If the code is different in your area, just change the numbers in lines 320, 330, 50000 and 50010. The city and country codes are kept in DATA statements, lines 470 to 610, and your calling list is kept in lines 620 to 630.

You can use lines 640 to 49998 to add telephone numbers, country codes and city codes by following this format: {country, city, or person's name}, {country code, city code, or phone number}.

Your formatted information is then put in a DATA line, using the DATA command.

---

*Sean Bossinger is a senior at South Dade High School in Homestead, Florida, where he is a member of the marching band, debate club and Social Studies Honor Society. Sean has owned his CoCo for seven years, and enjoys programming. He is also secretary/treasurer for the South Dade Computer Club.*



Dialing procedures vary according to the destination of your call (international, national long distance or local) and your method of dialing (manual keyboard entry or autodialing by name).

Dialing an international number is accomplished by entering the name of the country, the name of the city (type `NONE` if no code is needed) and the telephone number. If the code or name of a city or country is not on the list, call the operator to obtain it and add it to the list, making sure that you save the program again.

To dial a long-distance number within the United States or Canada, use manual keyboard entry or autodial by name. For manual entry, enter the area code and the telephone number. To autodial, type party name and press ENTER.

To place a local call manually, enter the telephone number. To autodial, enter the name of the party.

The parts of the program controlling modem dialing are in the lines where you see `ATDT`. If you want to change to pulse (rotary) dialing, change all `ATDT`s to `ATDP`s.

This program is designed to dial using a Hayes compatible autodial modem connected to the serial port on the rear of the CoCo. If you have a modem that is not Hayes compatible, just change the dialing code to suit your modem.

There is a timer routine in lines 340 to 410 that calculates how long you have been on the phone. After the modem finishes dialing, you will be prompted to pick up the handset and press ENTER. This will disconnect the modem and start the timer. Press any key to stop the timer and show how many minutes you have been on the phone.

The codes to run the RS-232 port in modem format rather than printer format were taken from Gary Davis' program found in the June 1984 issue of THE RAINBOW (Page 176). The codes disable the printer until you turn the machine off to reset the parameters (normal operating memory, no change).

If the name you entered for autodial by name is not found, you will be returned to the local, long-distance menu.

*(Questions about this article may be addressed to the author at 16220 S.W. 282 St., Homestead, FL 33033. Please enclose an SASE when requesting a reply.)* □

| Line | Description | Line | Description |
|---|---|---|---|
| 10-90 | Call modem setup, title pages and identifying `REM`s. | 50020 | `GOTO` timer routine. |
| 100 | Go to instruction screens if requested. | 60000-60070 | Local, U.S. and Canada long-distance dialing. |
| 110-120 | Main menu. | 60080 | Menu for manual or autodial for local calling. |
| 130-330 | International dialing section. | 60090-60100 | Manual entry for local dialing. |
| 340-410 | Timer routine. | 60110 | Beginning of long-distance section. |
| 420 | Asks for another number. | 60120 | Manual or autodial for long-distance calling. |
| 430-460 | Pokes printer port to enable modem attachment. | 60140-60160 | Manual entry for long-distance calling. |
| 470-610 | City names and codes, and country names and codes. | 60170-60370 | Instruction routine. |
| 620-49999 | Space for phone numbers, cities and countries. | 60380-60440 | Local, U.S. and Canada dial by name section. |
| 50000-50010 | Dial country without city codes. | | |

| | | | |
|---|---|---|---|
| 160 | 154 | 610 | 204 |
| 335 | 39 | 60100 | 94 |
| 480 | 156 | 60182 | 135 |
| 520 | 53 | 60191 | 65 |
| 580 | 7 | END | 201 |

**The listing:** AUTODIAL

```
10 CLEAR 10000:GOSUB 430:REM AUT
ODIALER FOR THE COCO
15 REM SEAN M. BOSSINGER
20 REM 16220 SW 282 ST
30 REM HOMESTEAD, FLORIDA 33033
40 CLS(4)
50 PRINT"    WELCOME TO THE AUTO
DIALER"
60 PRINT"  FOR LOCAL, AND LONG D
ISTANCE"
70 PRINT"      BY SEAN BOSSINGER
."
80 PRINT"   USING THE HAYES SMAR
TMODEM."
90 FOR X=1 TO 3000:NEXT X:CLS
100 INPUT"INSTRUCTIONS?(Y/N):";A
$:IF A$="Y" THEN GOSUB 60170
110 FORX=1 TO 200:NEXT X:CLS:PRI
NT"ENTER:":PRINT"1) FOR INTERNAT
IONAL":PRINT"2) FOR LOCAL AND NA
TIONAL.":INPUT"1 OR 2 PLEASE:";A
:IF A =1 OR A=2 THEN 120 ELSE 11
0
120 ON A GOTO 130,60000
125 REM BEGIN INTERNATIONAL
        AUTODIAL HERE
130 RESTORE
140 INPUT"ENTER THE COUNTRY NAME
:";CN$
150 READ A$,B:IF A$=CN$ THEN 190
 ELSE 160
160 IF A$="END" THEN 180
170 GOTO 150
180 PRINT"TRY AGAIN, COUNTRY NOT
 FOUND":GOTO 130
190 PRINT"COUNTRY CODE IS:";B
200 CC=B
210 INPUT"ENTER THE CITY NAME:";
CN$
220 IF CN$="NONE" THEN 230 ELSE
250
230 INPUT"ENTER THE CITY CODE";C
C(1):IF CC(1)=0 THEN 310
240 GOTO 310
250 RESTORE
260 READ A$,B:IF A$=CN$ THEN 300
 ELSE 270
270 IF A$="END" THEN 290
280 GOTO 260
290 PRINT"NO CITY BY THAT NAME F
OUND":GOTO 210
300 CC(1)=B
310 INPUT"ENTER THE PARTY NUMBER
";PN$:IF CC(1)=0 THEN 50000
320 PRINT"DIALING 011";CC;"-";CC
(1);PN$
330 PRINT#-2,"ATDT011";CC;" ";CC
(1);PN$
335 REM TIMER ROUTINE
340 PRINT"HIT <ENTER> TO START T
IMER, AND TO DISCONECT MODEM"
350 INPUT A$
360 PRINT#-2," "
370 S=0:M=0:CLS
380 FOR X=1 TO 456:NEXT X:S=S+1
390 PRINT@0,S;":SECONDS"
400 A$=INKEY$:IF A$="" THEN 380
ELSE 410
410 CLS:PRINT"TOTAL TIME ON PHON
E WAS:";:PRINTUSING"##.##";S/60:
PRINT"MINUTES."
420 INPUT"ANOTHER NUMBER(Y/N)";A
$:IF A$="Y" THEN 110 ELSE IF A$=
"N" THEN END ELSE 420
425 REM SET UP MODEM FOR DIALING
430 REM SETUP THE MODEM PORT
440 W=65314:X=W+1
450 POKE 149,0:POKE 150,180:POKE
 X,48:POKE W,249:POKE X,52:POKE
W,0:PRINT#-2,"ATS11=40"
460 RETURN
465 REM CITY AND COUNTRY CODES
470 DATA ALGERIA,213,AMERICAN SA
MOA,684,ANDORRA,33,ALL,078,ARGEN
TINA,54,BUENOS AIRES,1,CORDOBA,5
1,ATLANTIC OCEAN,871,AUSTRAILIA,
61,MELBOURNE,3,SYDNEY,2
480 DATA AUSTRIA,43,INNSBRUCK,52
22,VIENNA,222,BAHRAIN,973,BELGIU
M,32,ANTWERP,3,BRUSSELS,2,GHENT,
91,BELIZE,501,BOLIVIA,591,LA PAZ
,2,SANTA CRUZ,33,BRAZIL,55,BRASI
LIA,61,RIO DE JANEIRO,21,SAO PAU
LO,11
490 DATA CAMEROON,237,CHILE,56,S
ANTIAGO,2,VALPARAISO,31,COLUMBIA
,57,CALI,3,COSTA RICA,506,CYPRUS
,357,NICOSIA,21,CZECHOSLOVAKIA,4
2,DENMARK,45,AALBORG,8,COPENHAGE
N,1,ECUADOR,593,CUENCA,4,QUITO,2
,EGYPT,20
500 DATA EL SALVADOR,503,ETHIOPI
A,251,FIJI,679,FINLAND,358,HELSI
```

```
NKI,0,FRANCE,33,BORDEAUX,56,MARS
EILLE,91,NICE,93,PARIS,1,FRENCH
ANTILLES,596,FRENCH POLYNESIA,68
9,GABON,241,EAST GERMANY,37
510 DATA WEST GERMANY,49,STUTTGA
RT,711,BERLIN,30,FRANKFURT,611,M
UNICH,89,SCHWEINFURT,9721,GREECE
,30,ATHENS,1,RHODES,241,GUAM,671
,GUANTANAMO BAY,53,GUATEMALA,502
,GUATEMALA CITY,2,GUYANA,592,GEO
RGETOWN,02,HAITI,509,PORT AU PRI
NCE,1
520 DATA HONDURAS,504,HONG KONG,
852,KOWLOON,3,HUNGARY,36,ICELAND
,354,AKUREYRI,6,HAFNARFIJOROUR,1
,INDIA,91,INDONESIA,62,JAKARTA,2
1,IRAN,98,TEHERAN,21,IRAQ,964,BA
GHDAD,1,IRELAND,353,DUBLIN,1,GAL
WAY,91,ISRAEL,972,HAIFA,4,JERUSA
LEM,2,TEL AVIV,3,ITALY,39
530 DATA FLORENCE,55,NAPLES,81,R
OME,6,VENICE,41,IVORY COAST,225,
JAPAN,81,HIROSHIMA,822,TOKYO,3,Y
OKOHAMA,45,JORDAN,962,KENYA,254,
REPUBLIC OF KOREA,82,PUSAN,72,SE
OUL,2,KUWAIT,965,LIBERIA,231,LIB
YA,218,TRIPOLI,21
540 DATA LIECHTENSTEIN,41,ALL CI
TIES,75,LUXEMBOURG,352,MALAWI,26
5,MALAYSIA,60,KUALA LUMPUR,3,MEX
ICO,52,MEXICO CITY,5,TIJUANA,668
,MONACO,33,ALL CITIES,93,MOROCCO
,212
550 DATA NAMIBIA,264,NETHERLANDS
,31,AMSTERDAM,20,THE HAGUE,70,NE
THERLAND ANTILLIES,599,ARUBA,8,N
EW CALEDONIA,687,NEW ZEALAND,64,
AUCKLAND,9,WELLINGTON,4,NICARAGU
A,505,MANAGUA,2,NIGERIA,234,LAGO
S,1,NORWAY,47,BERGEN,5,OSLO,2
560 DATA OMAN,968,PACIFIC OCEAN,
872,PAKISTAN,92,PANAMA,507,PAPUA
 NEW GUINEA,675,PARAGUAY,595,ASU
NCION,21,PERU,51,AREQUIPA,54,LIM
A,14,PHILIPPINES,63,MANILA,2
570 DATA POLAND,48,PORTUGAL,351,
LISBON,1,QATAR,974,ROMANIA,40,BU
CURESTI,0,SAIPAN,670,SAN MARINO,
39,ALL POINTS,541
580 DATA SAUDI ARABIA,966,RIYADH
,1,SENEGAL,221,SINGAPORE,65,SOUT
H AFRICA,27,CAPE TOWN,21,JOHANNE
SBURG,11,PRETORIA,12,SPAIN,34,BA
RCELONA,3,LAS PALMAS,28,MADRID,1
,SEVILLE,54,SRI LANKA,94,KANDY,8
,SURINAME,597,SWEDEN,46,GOTEBORG
,31,STOCKHOLM,8
590 DATA SWITZERLAND,41,BERNE,31
,GENEVA,22,LUCERNE,41,ZURICH,1,T
AIWAN,886,TAINAN,62,TAIPEI,2,THA
ILAND,66,BANGKOK,2,TUNISIA,216,T
UNIS,1,TURKEY,90,ISTANBUL,11,IZM
IR,51,UNITED ARAB EMIRATES,971,A
BU DHABI,2,AJMAN,6,AL AIN,3,AWEI
R,49,DUBAI,4
600 DATA FUJAIRAH,91,RAS AL KHAI
MAH,7,SHARJAH,6,UMM AL QUWAIN,6,
UNITED KINGDOM,44,BELFAST,232,CA
RDIFF,222,EDINBURGH,31,GLASGOW,4
1,LIVERPOOL,51,LONDON,1,URUGUAY,
598,CANELONES,598,MERCEDES,532,M
ONTEVIDEO,2
610 DATA VATICAN CITY,39,ALL CIT
IES,6,VENEZUELA,58,CARACAS,2,MAR
ACAIBO,61,YEMEN,967,YUGOSLAVIA,3
8,BELGRADE,11
620 REM TELEPHONE DIRECTORY
        BEGINS HERE!
630 DATA MCI,3728501,DOWPHONE,18
00222024 8,RAINBOW,15022284492,EN
```

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```
D,0
49999 REM DIAL NUMBER WITHOUT
          CITY CODE
50000 PRINT"DIALING 011 ";CC;" "
;PN$
50010 PRINT#-2,"ATDT 011";CC;" "
;PN$
50020 GOTO 340
59999 REM LOCAL, U.S., AND
          CANADIAN DIALING
60000 CLS
60010 PRINT"ENTER:"
60020 PRINT"1) FOR LOCAL NUMBERS
"
60030 PRINT"2) FOR NATIONAL LONG
 DISTANCE"
60040 INPUT"1 OR 2 ONLY PLEASE:"
;A
60050 IF A=1 OR A=2 THEN 60070 E
LSE 60060
60060 GOTO 60010
60070 ON A GOTO 60080,60110
60075 REM MENU FOR LOCAL DIALING
60080 CLS:PRINT"1>MANUAL ENTER O
R 2>AUTO DIAL";:INPUT A:IF A=1 T
HEN 60090 ELSE 60380
60090 INPUT"ENTER THE NUMBER TO
DIAL";A$
60100 PRINT"DIALING ";A$:PRINT#-
2,"ATDT ";A$:GOTO 340
60110 CLS
60120 INPUT"1>MANUAL DIAL OR 2>A
UTO DIAL";A
60130 IF A=1 THEN 60140 ELSE 603
80
60140 INPUT"ENTER THE AREA CODE"
;AC$:INPUT"ENTER THE TELEHONE NU
MBER";TN$
60150 PRINT"DIALING ";AC$;"+";TN
$
60160 PRINT#-2,"ATDT1 ";AC$+TN$:
GOTO 340
60165 REM INSTRUCTION SCREENS
60170 PRINT"INSTRUCTIONS FOR AUT
ODIAL***"
60180 PRINT"INTERNATIONAL CALLIN
G:"
60181 PRINT"HIT <1>,  <ENTER> AT
 THE FIRST  PROMPT, FOLLOWED BY
COUNTRY     NAME, FOLLOWED BY CI
TY NAME     (IF APPLICABLE), FOL
LOWED       BY TELEPHONE NUMBER"
60182 PRINT"IF NO CITY CODE IS N
EEDED, THEN TYPE 'NONE' AT THE C
ITY NAME    PROMPT, FOLLOWED BY
0 AT THE    CITY CODE PROMPT, IF
 AN ALL     CITY CODE IS NEEDED,
 FOLLOW THE ABOVE INSTRUCTIONS,
EXCEPT, AT  THE CITY CODE PROMPT
,  ENTER THEALL POINT CODE.":
60183 INPUT"PRESS <ENTER> TO CON
TINUE";A$:CLS
60184 PRINT"FOR LOCAL CALLING:"
60185 PRINT"ENTER <2> AT THE FIR
ST PROMPT   FOLLOWED BY <1> AT T
HE NEXT     MENU."
60186 PRINT"FOR DIAL BY NAME ENT
ER <2> AND  THEN WHEN THE COMPUT
ER ASKS     FOR IT, ENTER THE PA
RTY  NAME."
60187 PRINT"FOR MANUAL KEYBOARD
ENTRY,      ENTER <1> AND WHEN T
HE COMPUTER ASKS FOR IT,  ENTER
THE PARTY   NAME."
60188 INPUT"<ENTER> TO CONTINUE"
;A$:CLS
60189 PRINT"U.S. AND CANADIAN DI
ALING"
60190 PRINT"ENTER <2> AT THE FIR
ST MENU,    FOLLOWED BY <2> AT T
HE SECOND   MENU."
60191 PRINT"FOR MANUAL DIALING,
ENTER <1>   AND WHEN THE COMPUTE
R ASKS FOR  THEM, ENTER THE AREA
 CODE, AND  THE TELEPHONE NUMBER
"
60192 PRINT"FOR AUTO-DIAL BY NAM
E, ENTER <2>AT THE MENU, THEN WH
EN THE      COMPUTER ASKS FOR IT
, ENTER     THE PARTY NAME":INPU
T"<ENTER> TO START PROGRAM";A$:C
LS:RETURN
60375 REM LOCAL, U.S. AND CANADA
          DIALING BY NAME
60380 CLS:INPUT"ENTER THE NAME O
F THE PARTY:";NP$
60390 RESTORE
60400 READ A$,B$:IF A$=NP$ THEN
60440 ELSE 60410
60410 IF A$="END" THEN 60420 ELS
E 60430
60420 PRINT"ENTRY NOT FOUND":FOR
 X=1 TO 1000:NEXT X:CLS:PRINT"RE
TURNING TO LOCAL,LONG DISTANCEME
NU.":FORX=1TO1000:NEXT X:CLS:GOT
O60000
60430 GOTO 60400
60440 CLS:PRINT"DIALING ";A$:PRI
NT#-2,"ATDT ";B$:GOTO 340
```

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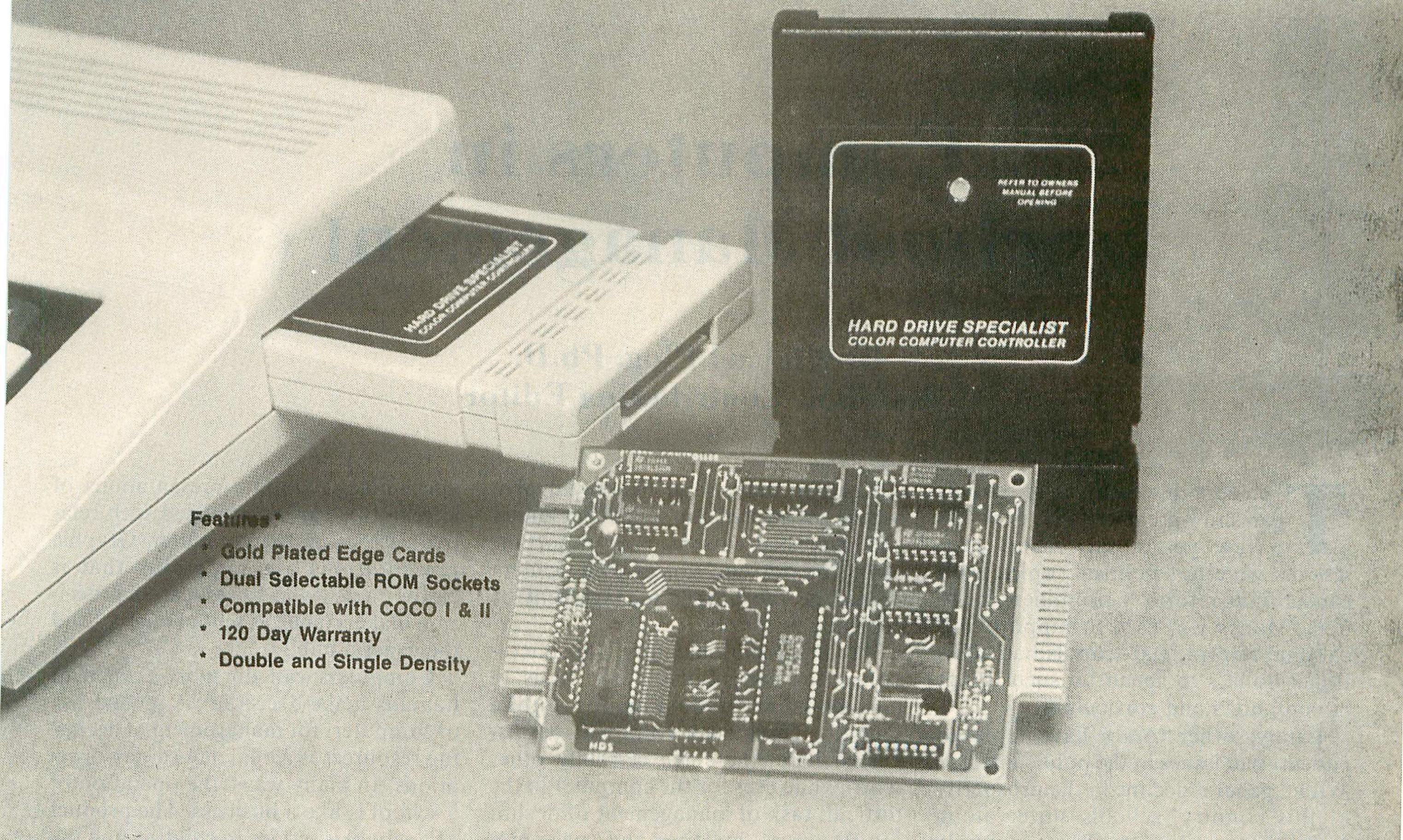
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# Computers in School Management

### By Michael Plog, Ph.D.
### Rainbow Contributing Editor

The economic fortunes of schools can show great variance over just a few years. Not long ago, schools were hot political topics, with educational reform a prominent news item. Money was used to support educational reform, and schools had additional dollars to spend on such things as computers and curriculum.

Lately, other topics have replaced educational issues in the public interest. With a general decline in the prosperity of this country, schools suffer along with other institutions. There is simply not enough money to do all the things that need to be done in schools; some things will have to be eliminated.

Management of expanding resources is not seen as much of a problem for school personnel. There are things to purchase that have been deferred from past years. Extra teachers can always be used, as well as additional aides, office clerical staff, and even central office professional positions. With expanding resources, a worthy use for money is always found.

The opposite position, that of declining resources for schools, is another matter entirely. When it comes time to eliminate programs or people, all things are important. Elimination choices are difficult to make, and usually involve heated debates among school personnel and interested citizens. One important topic for current educational leaders should be the proper management of declining resources.

As an educational tool, the microcomputer can play several roles in management of decline for public schools. Three such roles will be discussed here; there are certainly other worthwhile uses for the computer in the difficult task of management of declining resources, but time and space prevent a full examination.

First, computers can be used to help humans make difficult decisions. I do not mean that any decision itself should be left to the computer. After all, computers are logical, not reasonable, and cannot actually make an important decision affecting the lives of humans. Computers can, however, be used to provide their human masters with adequate information about alternatives.

One example of this use is discussions of budget alternatives. A spreadsheet is a powerful tool for development of alternatives in spending patterns. Different spending patterns (percentages of budget spent on faculty, support staff, administrative staff, materials, etc.) can be examined quickly and accurately. Nasty surprises around the middle of the year can be avoided. Least attractive spending patterns (and reduction plans) can be identified quickly and rejected from further consideration.

The spreadsheet is not the only use of the computer for discussions of budget alternatives. Graphic presentations of alternatives can be provided with relative ease using the computer. Graphic presentations are something that is easily understood by educational decision makers (such as school boards) and the general public.

Computers can do more than help humans make decisions. A second use of computers for management of declining resources is actual day-to-day operations. In many ways, the operation of a school is like a business. The product of a school is service to children and the larger community, but many activities are exactly the same in a school as in a business environment. People must be hired, given assignments, and supervised. Products must be purchased, moved to appropriate locations, and used to fulfill a specified purpose. Even extremely small businesses have computers today, and most school districts use machines to assist in day-to-day operations.

One physical product of schools is paper. Now, as every computer hobbyist knows, computers do not reduce paper work. In fact, the computer increases the volume of paper used in any operation. The advantage of the computer is in reducing the time spent on paperwork, and a reduction of the people needed for management of paper. Thus, computers can reduce the clerical time needed for handling forms, filing records, preparing reports, and a host of paper moving operations that are common to schools today. Records of demographic characteristics of chil-

---

*Michael Plog received his doctorate degree from the University of Illinois. He has taught social studies in high school, worked in the central office of a school district and is currently employed at the Illinois State Board of Education.*

dren attending just one school is a massive reporting task, and one required by most funding sources, including the federal and state governments. By maintaining such records on the computer, the paper produced is still massive, but the human work involved decreases dramatically.

Computers can also reduce the time teachers spend on non-teaching activities. All educational institutions require non-teaching activities of their faculty, including taking attendance, lunch counts, gathering information about individual students for special consideration, etc. Reducing time of faculty spent on non-teaching activities can also reduce the number of faculty needed. This is an unpleasant consideration — no one wants to reduce the number of teachers in schools. The inescapable difficulty is that in times of diminishing resources, personnel will have to be reduced.

The third use of the computer in times of decreasing resources takes place in the classroom. This is probably the most exciting use for educators because it relates directly to classrooms and students, instead of to business offices and other ancillary functions of schools.

During times of expanding resources, schools will buy computers. With more money available, it is reasonable to expect that additional units will be purchased. During times of decreasing resources, most schools will not be buying additional computers — available funds have to be used for higher priorities. Instead, the focus should be on better utilization of the current units in school buildings. The challenge for educators is to determine how to get more out of existing machines.

It is not too difficult to predict that in times of decreasing resources, schools will still be purchasing software for classroom computers. The type of software purchased may tend to be programs that will free teacher time, allowing a single teacher to deal with a greater number of students. Thus, we might expect more Computer Assisted Instruction (CAI) software sales during these times. We might also expect students to be spending more small group time at the machine, and less direct involvement with the teacher.

If software developers notice a need, we might also expect more innovative software on the market — requiring more interaction between student and machine than between student and teacher. It is entirely reasonable to expect that a student will spend less time with a teacher and more time with a machine.

This does not have to be a negative scenario. The time a child spends with a teacher is similar to the time a child spends with a parent. The amount of time is less important than what happens during that time. Structuring the learning experiences to include both human (teacher) and machine (computer) can be a positive feature for the education of a child. The crucial point is what is done with each set of experiences. In other words, the type of human interaction and the type of software become more important in this set of activities.

Americans have normally learned from adversity. Declining monetary resources for education is not a pleasant alternative, but it is a reality. It may be the case that this adversity to modern educators provides a challenge that will benefit future students.

If you have any arguments, comments, or suggestions, please send them to me at 829 Evergreen, Chatham, IL 62629.

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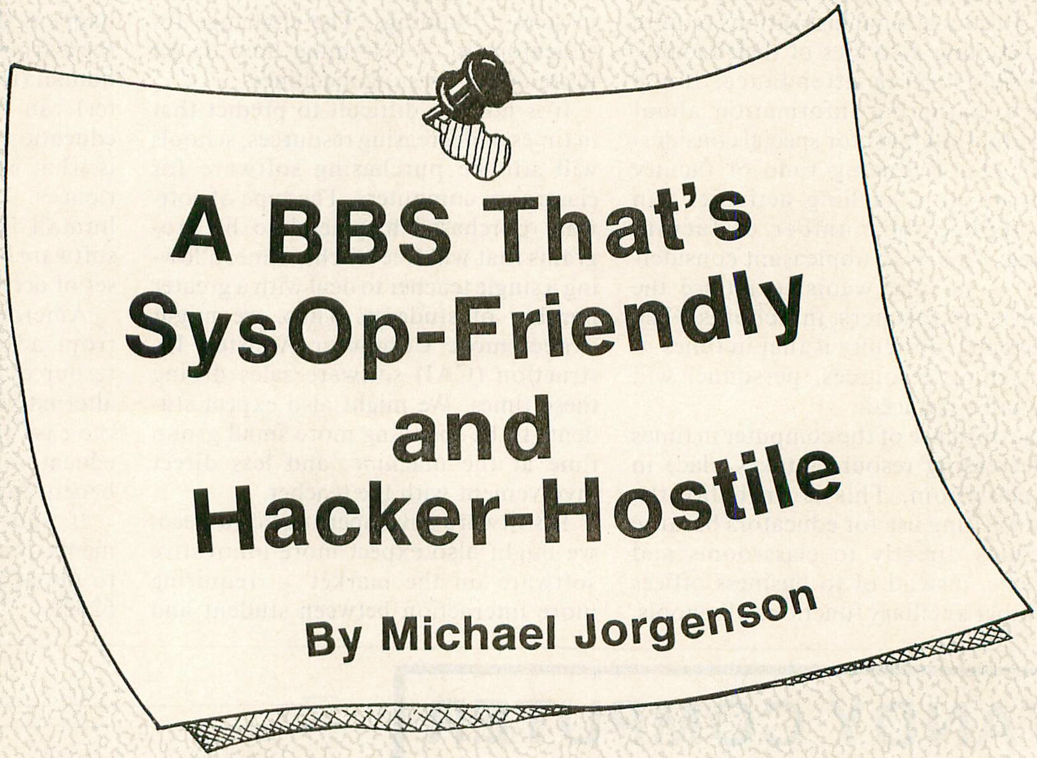

# A BBS That's SysOp-Friendly and Hacker-Hostile

### By Michael Jorgenson

A friend of mine decided he wanted to start a local Color Computer BBS, because there were none in the Lorain, Ohio, area. So we tested several bulletin board programs, from the very simple to the complex.

We found that the simple programs lacked flexibility and appeal, and the complex ones were too hostile to work with, needing almost constant attention to keep from crashing.

Then I came up with the BBS challenge. A challenge it was indeed — for it was left to me to write, my friend helping out now and then with the online testing and suggestions.

---

*Michael Jorgenson is an electrician living in Lorain, Ohio. He was introduced to programming by a CoCo Adventure game, which "kindled a thirst for knowledge that has become an obsession."*

It was my goal to write a serial port bulletin board program that was SysOp-friendly, distinctly different, appealing, and complex enough to offer the user a wide variety of features that are normally available only on commercial boards or complicated systems.

## Operating *BBS-Board*

This program was written to operate with *Remote 2*, a serial port driver by Dan Downard found in RAINBOW (November '83), and revised by Scott M. Taylor (November '85). If you prefer to use another driver, you'll need to edit a dozen or so lines — mainly data pokes.

*BBS-Board* will run on a 32K Color Computer with a single disk drive, but there will be little working room on the system disk for support files. The version provided is intended for two or more drives.

Only four program files are required with this bulletin board system: `BOOT.BAS`, `REMOTE2.SYS`, `BBS-BORD.SYS` and `SYSOP.EDT`. A text file generator program called `TEXTGEN.EDT` is also included to create the optional support files: `STARTUP.SXT`, `NEW-MBR.SXT`, `MESSAGE.HLP` and any other files that the SysOp may wish to add to his BBS.

## SysOp-friendly? You Can't Be Serious

Well, after trying quite a few of the other bulletin board programs, I like to think so. To start up a personalized *BBS-Board* station, all the SysOp needs to do is complete the following procedure:

1) The SysOp must have a master disk with the four system programs on it. Copy `BBS-BORD.SYS` and `SYSOP.EDT` to a blank, formatted disk, which will be called the online disk or the system disk.

2) Insert the online disk in Drive 0 and another formatted disk in Drive 1, then run SYSOP.EDT. Be sure to enter '1' at each of the four system log drive number prompts!

3) Enter the appropriate menu command to create the four system logs that are required for operation: USERLOG.SYS, MESSLOG.SYS, ACTSLOG.SYS and EXITLOG.SYS. Each will be initialized on Drive 1.

4) Select Option 11 on the menu to set up your SysOp access file as User No. 1. Enter your name (16 letters max), initials (3 letters max) and password (6 characters max). Your privilege flag is automatically set to 'A.' Take option "Return to BASIC" when finished.

5) Run TEXTGEN.EDT to create the startup for new members and "Leave Messages" help/support files listed above. If you do not want to use these three optional files at this time, load BBS-BORD.SYS and insert a REM marker in lines 130, 530 and 1615. Add the following to the program: Line 531 GOTO 505 and Line 1616 GOTO 215.

6) You should now have three disks: a master disk with four program files, an online disk with two to five files and the system logs disk with four files on it. *BBS—Board* should now be ready to run!

7) Use your master disk to boot the system — type RUN "BOOT". At the first prompt, remove your master disk and insert the online disk in Drive 0 and the system logs disk in Drive 1. Follow the prompts to tailor the operating parameters to suit your needs.

**Note:** *BBS-Board* has been written to accept *only* lowercase commands! This also applies to your keyboard, as well. It would be advisable to echo the output in uppercase, but that is a matter of preference. The choice of cursor color is for your benefit; a user should never see it at all.

8) Finally, it would be a good idea to make backup copies of all three system disks now, before it's too late.

**The Remote SysOp Access Feature**

The SysOp can call the BBS from a remote computer and gain complete access to the running system. This is accomplished through a backdoor password and a special input command in the main menu board. When the SysOp enters a 'Z' at the main board, a secret password prompt will appear (enter carefully). This password can be numbers and/or letters of any length.

If the password is correct, the SysOp program SYSOP.EDT will run, and all input will be changed to lowercase/uppercase as received. The SysOp will then have complete control over all file information. Choosing Option 12 on the SysOp program menu will return the system to running status when the SysOp is finished. All the SysOp needs to do is reset the date, caller number and actslog number for the next user.

The SysOp must edit Line 995 of the BBS-BORD.SYS program to include his name, initials and backdoor password where indicated before this feature will operate.

**Warning:** Do not direct the output to the printer while using this feature! Your modem will probably be plugged into the serial port.

**Command Structure and Features**

The *BBS-Board* system includes a main or central command board, seven user-accessible sub-boards, a sign-off board and six supporting features. A SysOp Chat routine can be called by the SysOp from any of the system's eight boards by entering an uppercase 'X'.

When running, the program will post an abbreviated list of commands for each of the eight system boards. Any entry not listed will display the Menu Help for that board, giving a short description for each command letter. With exception to the "Leave Messages" board, which will input support file MESSAGE.HLP, an entry of 'h' will also activate this Menu Help display. 'G'

**Main Board Input Commands**
**(excludes 'Z' and 'X' for SysOp)**

| | | | | | |
|---|---|---|---|---|---|
| a | = | art/graphics board | n | = | username relog on |
| b | = | bulletin message board | p | = | page system operator |
| d | = | download program files | r | = | read message board |
| g | = | goodbye/sign off BBS | t | = | textfiles to review |
| h | = | help/main menu board | u | = | user access options |
| l | = | leave messages board | x | = | date and time remaining |

| **Sub-board Input Commands** | | | **Privilege Flag Required** |
|---|---|---|---|
| c | = | change a logon password | 1 |
| d | = | download program files | 3 |
| d | = | display system tracer file | 1 |
| e | = | E-mail check for messages | 1 |
| e | = | E-mail message to member | 2 |
| g | = | goodbye/sign off BBS | 0 |
| h | = | help/menu for that board | 0 |
| k | = | kill an E-mail message letter | 2 |
| l | = | leave a system message letter | 2 |
| r | = | read or review | 0/1 |
| s | = | scan for what is needed | 0 |
| v | = | view art-graphics files (8 bits) | 1 |
| x | = | return to main board | 0 |

Table 1

for "Goodbye/Sign-off" and 'X' for "Return to the Main Board" have been included in the operational command set for each system sub-board.

In most cases, a user's privilege flag must equal or exceed the value required to access a sub-board feature: A = 3, B = 2, C = 1. Any guest who does not log on receives no privilege flag, but will still be able to use this system, though limited considerably.

Table 1 gives a list of commands and other features.

### Support File Structure and Extension Code

Unless otherwise amended by the SysOp, this system will expect to find all of its support files — whether Help, Text, Graphics, Bulletin Boards, or Downloads — on Drive 0. This is accomplished through `DSKI$`; the sub-boards which require its use will search for their program files by extension classification. This three-letter extension code uses the first letter of an extension to determine the file category: Bulletin, Text or Download. The last two letters are used to place the file in its appropriate sub-board.

> *Bulletin board files:* last two letters of extension = `BD`. First letter categories are: `B` = "Bargains," `C` = "CoCo-Luv," `N` = "BBS News" and all others = "Whatever."
>
> *Download program files:* last two letters of extension = `DL`. First letter categories are: `G` = "a Game," `U` = "Utility" and all others = "General."
>
> *Graphic art files:* last two letters of extension = `RT`. The only category available is `A` and the files extension must be `ART`. All graphic art files must be 16 lines in length, a full screen.
>
> *Text program files:* last two letters of extension = `XT`. First letter categories are: `C` = "Computer," `S` = "Support" and all others = "General."

### *BBS-Board* System Logfiles

The four system logs required for operation can easily be accessed and maintained through the `SYSOP.EDT` program. Each is a direct access file capable of storing from 100 to 300 records, depending on the log. The Actslog will start over again when full, while the others will refuse further input requests. If such is the case, a "Logfull," entry condition message will be given. The limit for all message input is seven lines — 224 characters.

### General Information

The access time control of the system is somewhat accurate at best, but it's far better than nothing at all. I considered using a binary clock routine, but I decided it was more trouble than it was worth.

I also wanted my program to accurately account for the user's access time and actions by completely eliminating the need for line input through the use of an `INKEY$` subroutine. But here I failed, due, in part, to the slowness of ASCII and BASIC itself. I had to rewrite the "Leave Message" routine to line input. This is the only part of the system that an inconsiderate user can hang up! It seems that by the time an `INKEY$` command is processed, it's often too late to catch all of the next character sent. Single input response commands work just fine, however.

When an `INKEY$` response is required in my program, it jumps to a subroutine which keeps track of elapsed and user access time in seconds. If a user disconnects, or a key hasn't been pressed in a predetermined amount of time, the system goes to sign-off. It will then reset in minutes for the next caller if no response is given. In the latter case, if a single input command was required, a warning message would have been displayed.

I'm sorry to say that I do not have a program for graphic generation to offer, but the `GRAFMESS` file from *Rainbord*, written by Dr. Lane Lester for RAINBOW (November '83), can be used for this purpose.

The motoron/motoroff routine in the `BBS-BORD.SYS` program will require a small hardware project on the part of the SysOp before this feature can be of any use. The cassette cable motor jack must be connected to a phone answering switch or similar device. This can also be done by splicing the line, but the motoron/motoroff procedure will have to be reversed. When working, this routine will effectively cut off the caller after sign-off by interrupting the phone line.

*(Question about this program may be directed to the author at 749 Tower Blvd., Lorain, OH 44052. Please enclose an SASE for a response.)* ☐

*Editor's Note:* `REMOTE2.SYS` *appeared on Page 106 of the November 1985 issue of* THE RAINBOW. `BBS-BORD` *requires this file for operation. In the interest of conserving space, we are not reprinting that assembly listing here. You should refer to that issue if you wish to type in and assemble* `REMOTE2`. *Alternatively, the file will appear on this month's* RAINBOW ON TAPE *and* RAINBOW ON DISK. *To transfer the file from tape to disk, first* `CLOADM` *the file. Then type* `SAVEM"REMOTE2/SYS",&H7D00, &H7EF6, &H7D32` *and* ENTER.

**Listing 1:** `BOOT.BAS`

```
10 '--------------------
15 '  bbs-board system
20 '  preload bootfile
25 '--------------------
30 PCLEAR1:CLS
35 PRINT@33,"** BBS-BORD BULLETI
N SYSTEM **"
40 CLEAR 512,&H7D00
45 LOADM "REMOTE2/SYS":EXEC
50 PRINT@33,"** BY:  MIKE JORGEN
SON 1986 **":FORX=1TO750:NEXT
55 PRINT@33,"*** BBS-BORD PRELOA
D SETUP ***":PRINT:PRINT
60 LINEINPUT" DISABLE BREAK:
 <Y/N> ?  ";Q$
65 IF Q$<>"N"THEN75
70 POKE &H7D00,0
75 LINEINPUT" CORNER DISPLAY:
 <Y/N> ?  ";Q$
80 IF Q$<>"N"THEN90
85 POKE &H7D01,0
90 LINEINPUT" LINEFEEDS / CR:
 <Y/N> ?  ";Q$
95 IF Q$<>"N"THEN105
100 POKE &H7D02,0
105 LINEINPUT" LOWERCASE INPUT:
  <Y/N> ?  ";Q$
110 IF Q$<>"Y"THEN120
115 POKE &H7D04,2
120 LINEINPUT" UPPERCASE OUTPUT:
  <Y/N> ?  ";Q$
125 IF Q$<>"Y"THEN135
130 POKE &H7D05,1
135 LINEINPUT" SCROLL TOP LINE:
  <Y/N> ?  ";Q$
140 IF Q$<>"Y"THEN150
145 POKE &H7D08,32
150 PRINT:PRINT" CURSOR COLOR:
 <ENTER=YELLOW>"
155 PRINT:PRINT"  1. YELLOW":PRI
NT"  2. GREEN        <INVISIBLE>"
:PRINT"  3. DARK BLUE":PRINT"  4
. LIGHT BLUE":PRINT"  5. PURPLE"
:PRINT"  6. ORANGE":PRINT"  7. W
HITE":PRINT"  8. RED":PRINT:PRIN
T:PRINT:PRINT
160 Q$=INKEY$:ON VAL(Q$)GOTO205,
170,175,180,185,190,195,200
165 IFQ$=CHR$(13)THEN205 ELSE160
170 POKE &H7D06,143:GOTO205
175 POKE &H7D06,175:GOTO205
180 POKE &H7D06,223:GOTO205
185 POKE &H7D06,239:GOTO205
190 POKE &H7D06,255:GOTO205
195 POKE &H7D06,207:GOTO205
200 POKE &H7D06,191
205 RUN "BBS-BORD/SYS"
```

| | | | | | |
|---|---|---|---|---|---|
| 100 | 208 | 635 | 107 | 1180 | 9 |
| 160 | 9 | 700 | 62 | 1215 | 130 |
| 225 | 61 | 750 | 207 | 1295 | 16 |
| 265 | 57 | 810 | 176 | 1365 | 224 |
| 360 | 14 | 870 | 24 | 1470 | 86 |
| 405 | 212 | 920 | 73 | 1535 | 224 |
| 470 | 202 | 985 | 200 | 1590 | 97 |
| 520 | 237 | 1050 | 34 | 1655 | 137 |
| 580 | 42 | 1120 | 106 | END | 15 |

**Listing 2:** BBS-BORD.SYS

```
10 ' -------------------
15 '   the bbs-board
20 '   communications
25 '   bulletin system
30 ' ---------------------
35 CLEAR5000:PRINTCHR$(12)
40 DIM TX$(40),GR$(16):CLS
45 PRINT:PRINT" THE BBS-BORD BUL
LETIN SYSTEM":PRINT" PLEASE ENTE
R DATE: <MTH/DA/YR>":PRINT:LINEI
NPUT" ";DA$:PRINT
50 LINEINPUT" ACTSLOG DRIVE:  <0
/3> ?  ";AL$:IFAL$=""THENAL$="0"
55 LINEINPUT" USERLOG DRIVE:  <0
/3> ?  ";UL$:IFUL$=""THENUL$="0"
60 LINEINPUT" MESSLOG DRIVE:  <0
/3> ?  ";ML$:IFML$=""THENML$="0"
65 LINEINPUT" EXITLOG DRIVE:  <0
/3> ?  ";EL$:IFEL$=""THENEL$="0"
70 PRINT:LINEINPUT" START CALLER
 NUMBER:  ";CN$:CN=VAL(CN$):CN$=
"":IFCN>0THENCN=CN-1
75 LINEINPUT" START ACTLOG NUMBE
R:  ";LA$:AL=VAL(LA$):LA$="":IFA
L>0THENAL=AL-1
80 ' -------------------
85 ' bbs startup routine
90 ' -------------------
95 LG$=" ":PRINT:PRINT" PLEASE I
NSERT THE ONLINE DISC.":PRINT" P
RESS ANY KEY WHEN READY ...";
100 IFINKEY$=""THEN100
105 PRINTCHR$(12):CLS:UN$="":PRI
NT:PRINT"   THE BBS IS NOW ON ST
ANDBY!":SO=0:LM=0:LINEINPUT CM$
110 PRINTCHR$(12):CLS:FORX=1TO20
0:NEXT:FR$="":FLAG=0:CN=CN+1:AL=
AL+1:SC=450:CB=223:LP=0
115 ' -------------------
120 ' initial welcome text
125 ' -------------------
130 FX$="STARTUP/SXT":GOSUB1320
135 PRINT"        <<<  "DA$"  >>>"
:PRINT:PRINT:PRINT" YOU ARE CALL
ER NUMBER: ";CN:PRINT
140 PRINT" IF YOU'RE NOT A MEMBE
R, PLEASE":PRINT" ENTER <N> AT T
HE PROMPT BELOW!":PRINT:PRINT:PR
INT" BBS MEMBER:  <Y/N> ?"
145 GOSUB1385:IFCM$="y"THENPRINT
" YES":GOTO150 ELSEIFCM$="n"THEN
PRINT" NO":GOTO1505 ELSE145
150 PRINT:PRINT" DATA BITS:  <7/
8=COLOR> ?"
155 GOSUB1385:BITS=VAL(CM$):IF B
ITS<7 OR BITS>8THEN155
160 PRINT BITS:PRINT:GOSUB1350:P
RINT" ========= USER LOGON =====
====":PRINT:LP=1:TR=1
 165 ' -------------------
 170 ' user logon routine
175 ' -------------------
180 PRINT:PRINT" USER NUMBER:  "
;:Q$="":POKE&H7D03,88:GOSUB1385:
POKE&H7D03,0:GOTO190
185 IFTR=4THEN1635 ELSE180
190 X=VAL(Q$):IFX<1 OR X>300THEN
TR=TR+1:GOTO185 ELSEPRINT:PRINT:
GOSUB960:GET #1,X:NL$=IN$:TR=1
195 PRINT" PASSWORD:  ";:Q$="":P
OKE&H7D03,88:GOSUB1385:POKE&H7D0
3,0:PRINT:IFUN$=NL$THEN1635
200 IFQ$=PW$THENNA$=NM$:F$=FL$:P
RINT:PRINT:PRINT" HELLO, "NA$" <
"NL$">":GOTO205 ELSETR=TR+1:IFTR
=4THEN1635 ELSE195
205 PRINT" LAST LOGON DATE:  "LU
$:LSET LU$=DA$:PUT #1,X:CLOSE #1
:LP=0:IFF$="A"THEN FLAG=3 ELSEIF
F$="B"THEN FLAG=2 ELSEFLAG=1
210 C=1:PRINT:PRINT" CHECKING FO
R E-MAIL MESSAGES;":PRINT" ONE M
OMENT PLEASE ...":GOSUB1085
215 CM$=NL$:GOSUB1465:TW=300:IF
FLAG=3THENTA=40 ELSEIF FLAG=2THE
NTA=30 ELSETA=20
220 PRINT:PRINT" TIME ALLOCATION
: ";TA;"MINUTES!":SC=TA*60
225 ' -----------------
230 ' main command menu
235 ' -----------------
240 SC=SC-6:PRINT:CB=239:GOSUB13
50:CB=223:PRINT" ========= MAIN
BOARD =========":PRINT:PRINT
245 PRINT" < A B D G H L N P R T
 U X >":GOSUB1385:C=INSTR("hnxpb
rldtaugzX",CM$):PRINT" "CM$:GOSU
B1465:IFC=14THENGOSUB985:GOTO240
 ELSEON C GOTO250,270,290,325,35
0,430,505,610,695,780,870,1635,9
95
250 PRINT:GOSUB1360:PRINT"
   MAIN MENU HELP":PRINT:PRINT
255 PRINT" A) RT / GRAPHICS BOAR
D":PRINT" B) ULLETIN MESSAGE BOA
RD":PRINT" D) OWNLOAD PROGRAM FI
LES":PRINT" G) OODBYE / SIGN OFF
 BBS":PRINT" H) ELP / MAIN MENU
BOARD"
260 PRINT" L) EAVE MESSAGES BOAR
D":PRINT" N) AME LOGON / IF YOU
CAME":PRINT"    ONBOARD AFTER ST
ARTUP":PRINT" P) AGE SYSTEM OPER
ATOR"
265 PRINT" R) EAD MESSAGES BOARD
":PRINT" T) EXT FILES TO REVIEW"
:PRINT" U) SER ACCESS OPTIONS":P
RINT" X) DATE & TIME REMAINING":
SC=SC-15:GOTO240
270 UN$=NL$:GOSUB1480:FORX=1TO50
0:NEXT:GOTO110
275 ' ------------------
280 ' date & time routine
285 ' ------------------
290 TA=0:SS=SC:GOTO300
295 TA=TA+1:SS=SS-60
300 IF SS>59THEN295
305 TA$=STR$(TA):SS$=STR$(SS):PR
INT:PRINT:PRINT" "DA$"    /    T
IME:"TA$;SS$:SC=SC-2:GOTO240
310 ' ------------------
315 ' sysop page routine
320 ' ------------------
325 PRINT:PRINT:PRINT" OK, PAGIN
G SYSTEM OPERATOR ...":PRINT" ";
:FORX=1TO10:PRINT" / ";:SOUND110
,5:NEXT:PRINT
330 PRINT" !! THE SYSOP HAS BEEN
 PAGED !!":SC=SC-6:GOTO240
335 ' ---------------
340 ' bulletin boards
345 ' ---------------
350 SC=SC-3:PRINT:PRINT:PRINT" =
====== BULLETIN BOARD =======":P
RINT
355 PRINT:PRINT" < G H R S X >":
GOSUB1385:C=INSTR("hsrgxX",CM$):
PRINT" "CM$:GOSUB1465:IFC=6THENG
OSUB985:GOTO350 ELSEON C GOTO360
,375,405,1635,240
360 GOSUB1355:PRINT"      BULLET
IN SYSTEM HELP":PRINT:PRINT
365 PRINT" G) OODBYE / SIGN OFF"
:PRINT" H) ELP / THIS BOARD":PRI
NT" R) EAD BULLETIN NEWS":PRINT"
 S) CAN TOPIC HEADERS":PRINT" X)
 RETURN TO MAIN":PRINT
370 GOSUB1355:SC=SC-15:GOTO355
375 PRINT:DF=0:FORX=3TO11:DSKI$0
,17,X,A$,B$:A$=A$+LEFT$(B$,120):
FORK=0TO7:SB$=MID$(A$,K*32+1,8):
XT$=MID$(A$,K*32+9,3):Y=ASC(SB$)
:IFY=255THENK=7:X=11:GOTO395
380 IFY=0 OR RIGHT$(XT$,2)<>"BD"
THEN395 ELSEIFC<>3THEN390
385 IFSB$<>FX$THEN395 ELSEFX$=FX
$+"/"+XT$:GOSUB1320:GOTO350
390 DF=1:PRINT" "SB$"   /    ";:
D$=LEFT$(XT$,1):IFD$="C"THENPRIN
T"COCO-LUV"ELSEIFD$="B"THENPRINT
"BARGAINS"ELSEIFD$="N"THENPRINT"
BBS-NEWS"ELSEPRINT"WHATEVER"
395 NEXTK,X:IFC=3THENGOSUB1295:G
OTO350 ELSEIFDF=1THEN350
400 PRINT" SORRY,  "NA$:PRINT" N
O SYSTEM BULLETINS TO SCAN!":SC=
SC-5:GOTO350
405 PRINT:PRINT" OK, ENTER A BOA
RD OF CHOICE ?":PRINT" ";

410 GOSUB1330:IFL>8 OR L<3THENGO
SUB1290:GOTO350 ELSE375
415 ' ------------------
420 ' read message board
425 ' ------------------
430 SC=SC-3:PRINT:PRINT:PRINT" =
======= READ MESSAGES =======":P
RINT
435 PRINT:PRINT" < E G H K R S X
 >":GOSUB1385:C=INSTR("hsrekgxX"
,CM$):PRINT" "CM$:GOSUB1465:IFC=
8THENGOSUB985:GOTO430 ELSEON C G
OTO440,455,455,470,475,1635,240
440 GOSUB1355:PRINT"      READ ME
SSAGE HELP FILE":PRINT:PRINT
445 PRINT" E) MAIL MESSAGE CHECK
":PRINT" G) OODBYE / SIGN OFF":P
RINT" H) ELP / THIS BOARD":PRINT
" K) ILL E-MAIL MESSAGES":PRINT"
 R) EAD SYSTEM MESSAGES":PRINT"
S) CAN MESSAGE HEADERS":PRINT" X
) RETURN TO MAIN":PRINT
450 GOSUB1355:SC=SC-16:GOTO435
```

```
455 PRINT:PRINT" OK, AT WHAT NUM
BER WOULD YOU":PRINT" LIKE TO ST
ART:  <1-300> ? ";:LP=1
460 Q$="":GOSUB1385:PRINT:SM=VAL
(Q$):LP=0:IFC=2THENSC=SC-60 ELSE
SC=SC-90
465 GOSUB1085:GOTO430
470 IFFR$<>""THENGOSUB1280:GOTO4
30 ELSEPRINT:PRINT" OK, CHECKING
 FOR E-MAIL:  JUST":PRINT" A MOM
ENT, PLEASE ...":GOTO465
475 PRINT:IF FLAG<2THENPRINT" SO
RRY,  "NA$:PRINT" ONLY MEMBERS H
AVE MAIL TO KILL":GOTO430
480 PRINT" OK, ENTER THE MESSAGE
 NUMBER":PRINT" OF YOURS TO KILL
:  <1-300> ?":PRINT" ";:LP=1
485 Q$="":GOSUB1385:PRINT:X=VAL(
Q$):LP=0:IFX>0 AND X<301THEN465
ELSEPRINT:PRINT" SORRY,  "NA$:PR
INT" THAT'S NOT AN E-MAIL NUMBER
!":SC=SC-2:GOTO430
490 ' ------------------
495 ' leave message board
500 ' ------------------
505 SC=SC-3:PRINT:PRINT:PRINT" =
====== LEAVE MESSAGES =======":P
RINT
510 PRINT:PRINT" < E G H L S X >
":GOSUB1385:Q=INSTR("helgxsX",CM
$):PRINT" "CM$:GOSUB1465:IFQ=6TH
ENGOSUB900:GOTO505 ELSEIFQ=7THEN
GOSUB985:GOTO505 ELSEON Q GOTO53
0,535,535,1635,240
515 GOSUB1355:PRINT"          LEAVE
 MESSAGE MENU":PRINT:PRINT
520 PRINT" E) MAIL SYSTEM LETTER
":PRINT" G) OODBYE / SIGN OFF":P
RINT" H) ELP / BBS MESSAGES":PRI
NT" L) EAVE SYSTEM MESSAGE":PRIN
T" S) CAN USERLOG FILE":PRINT" X
) RETURN TO MAIN":PRINT
525 GOSUB1355:SC=SC-15:GOTO510
530 FX$="MESSAGE/HLP":GOSUB1320:
GOTO505
535 IF FLAG<2THENPRINT:PRINT" SO
RRY,  "NA$:PRINT" YOU MUST BE A
MEMBER TO LEAVE":PRINT" SYSTEM M
ESSAGES OR E-MAIL!":GOTO240
540 C=6:GOSUB1085:IFMF<1THENGOSU
B1285:GOTO505
545 IFQ=3THENI$="ALL":GOTO575
550 PRINT:PRINT" ENTER <3> INITI
ALS PLEASE: ";:LP=1
555 Q$="":GOSUB1385:PRINT:I$=Q$:
LP=0:IF LEN(Q$)=3THEN565
560 PRINT:PRINT" YOU MUST ENTER
3 INITIALS FOR":PRINT" ALL E-MAI
L TO ANOTHER MEMBER!":GOTO505
565 IFNL$=I$THENPRINT:PRINT" SOR
RY,  "NA$:PRINT" YOU CAN'T LEAVE
 YOUR OWN MAIL!":GOTO505
570 GOSUB1255:IFNK<>1THEN505 ELS
EGOSUB950:IF MBR<>1THENGOSUB1280
:GOTO505
575 PRINT:PRINT" SUBJECT:  <8 LE
TTERS MAX> ?":PRINT" ";:LP=1
580 Q$="":GOSUB1385:PRINT:S$=Q$:
LP=0:L=LEN(Q$):IFL>8 OR L<3THENG
OSUB1290:GOTO505
585 SC=SC-13:IFQ=2THENSC=SC-3
590 GOSUB1005:PRINT:GOSUB1355:CB
=223:GOTO505
595 ' ------------------
600 ' download files board
605 ' ------------------
610 SC=SC-3:PRINT:PRINT:PRINT" =
====== DOWNLOADS BOARD ======":P
RINT
615 PRINT:PRINT" < D G H S X >":
GOSUB1385:C=INSTR("hsdgxX",CM$):
PRINT" "CM$:GOSUB1465:IFC=6THENG
OSUB985:GOTO610 ELSEON C GOTO620
,635,665,1635,240
620 GOSUB1355:PRINT"          DOWNL
OAD MENU HELP":PRINT:PRINT
625 PRINT" D) OWNLOAD SYSTEM FIL
ES":PRINT" G) OODBYE / SIGN OFF"
:PRINT" H) ELP / THIS BOARD":PRI
NT" S) CAN DOWNLOAD HEADERS":PRI
NT" X) RETURN TO MAIN":PRINT
630 GOSUB1355:SC=SC-15:GOTO615
635 PRINT:DF=0:FORX=3TO11:DSKI$0
,17,X,A$,B$:A$=A$+LEFT$(B$,120):
FORK=0TO7:SB$=MID$(A$,K*32+1,8):
XT$=MID$(A$,K*32+9,3):Y=ASC(SB$)
:IFY=255THENK=7:X=11:GOTO655
640 IFY=0 OR RIGHT$(XT$,2)<>"DL"
THEN655 ELSEIFC<>3THEN650
645 IFSB$<>FX$THEN655 ELSECM$=FX
$:GOSUB1465:FX$=FX$+"/"+XT$:GOSU
B1320:GOTO610
650 DF=1:PRINT" "SB$"   /   ";:
D$=LEFT$(XT$,1):IFD$="G"THENPRIN
T"A GAME"ELSEIFD$="U"THENPRINT"U
TILITY"ELSEPRINT"GENERAL"
655 NEXTK,X:IFC=3THENGOSUB1295:G
OTO610 ELSEIFDF=1THEN610
660 PRINT" SORRY,  "NA$:PRINT" N
O DOWNLOAD FILES TO SCAN!":SC=SC
-5:GOTO610
665 PRINT:IF FLAG<3THENPRINT" SO
RRY,  "NA$:PRINT" ONLY VALIDATED
 MEMBERS CAN":PRINT" DOWNLOAD OU
R PROGRAM FILES!":GOTO240
670 PRINT" OK, ENTER A PROGRAM F
ILENAME ?":PRINT" ";
675 GOSUB1330:IFL>8 OR L<3THENGO
SUB1290:GOTO610 ELSE635
680 ' ------------------
685 ' text program board
690 ' ------------------
695 SC=SC-3:PRINT:PRINT:PRINT" =
======== TEXT FILES =========":P
RINT
700 PRINT:PRINT" < G H R S X >":
GOSUB1385:C=INSTR("hsrgxX",CM$):
PRINT" "CM$:GOSUB1465:IFC=6THENG
OSUB985:GOTO695 ELSEON C GOTO705
,720,750,1635,240
705 GOSUB1355:PRINT"          TEXT
PROGRAM HELP":PRINT:PRINT
710 PRINT" G) OODBYE / SIGN OFF"
:PRINT" H) ELP / THIS BOARD":PRI
NT" R) EVIEW TEXT FILES":PRINT"
S) CAN TEXT HEADERS":PRINT" X) R
ETURN TO MAIN":PRINT
715 GOSUB1355:SC=SC-15:GOTO700
720 PRINT:DF=0:FORX=3TO11:DSKI$0
,17,X,A$,B$:A$=A$+LEFT$(B$,120):
FORK=0TO7:SB$=MID$(A$,K*32+1,8):
XT$=MID$(A$,K*32+9,3):Y=ASC(SB$)
:IFY=255THENK=7:X=11:GOTO740
725 IFY=0 OR RIGHT$(XT$,2)<>"XT"
THEN740 ELSEIFC<>3THEN735
730 IFSB$<>FX$THEN740 ELSEFX$=FX
$+"/"+XT$:GOSUB1320:GOTO695
735 DF=1:PRINT" "SB$"   /   ";:
D$=LEFT$(XT$,1):IFD$="C"THENPRIN
T"COMPUTER"ELSEIFD$="S"THENPRINT
"SUPPORT"ELSEPRINT"GENERAL"
740 NEXTK,X:IFC=3THENGOSUB1295:G
OTO695 ELSEIFDF=1THEN695
745 PRINT" SORRY,  "NA$:PRINT" N
O TEXT FILES FOUND TO SCAN!":SC=
SC-5:GOTO695
750 PRINT:IF FLAG<1THENPRINT" SO
RRY,  "NA$:PRINT" YOU MUST BECOM
E A MEMBER TO":PRINT" REVIEW OUR
 TEXTFILE PROGRAMS!":GOTO240
755 PRINT" OK, ENTER A PROGRAM F
ILENAME ?":PRINT" ";
760 GOSUB1330:IFL>8 OR L<3THENGO
SUB1290:GOTO695 ELSE720
765 ' ------------------
770 ' graphic-art board
775 ' ------------------
780 SC=SC-3:PRINT:PRINT:PRINT" =
===== GRAPHIC-ART BOARD =====":P
RINT
785 PRINT:PRINT" < G H S V X >":
GOSUB1385:C=INSTR("hsvgxX",CM$):
PRINT" "CM$:GOSUB1465:IFC=6THENG
OSUB985:GOTO780 ELSEON C GOTO790
,805,840,1635,240
790 GOSUB1355:PRINT"          GRAP
HIC-ART HELP":PRINT:PRINT
795 PRINT" G) OODBYE / SIGN OFF"
:PRINT" H) ELP / THIS BOARD":PRI
NT" S) CAN GRAPHIC FILES":PRINT"
 V) IEW GRAPHIC FILES":PRINT" X)
 RETURN TO MAIN":PRINT
800 GOSUB1355:SC=SC-15:GOTO785
805 IF BITS=7THENPRINT:PRINT" SO
RRY, YOU MUST RECEIVE 8 DATA":PR
INT" BITS TO VIEW COLOR GRAPHICS
!":SC=SC-2:GOTO240
810 PRINT:DF=0:FORX=3TO11:DSKI$0
,17,X,A$,B$:A$=A$+LEFT$(B$,120):
FORK=0TO7:SB$=MID$(A$,K*32+1,8):
XT$=MID$(A$,K*32+9,3):Y=ASC(SB$)
:IFY=255THENK=7:X=11:GOTO830
815 IFY=0 OR XT$<>"ART"THEN830
820 IFC<>3THEN825 ELSEIFSB$<>FX$
THEN830 ELSEFX$=FX$+"/"+XT$:GOSU
B1340:PRINT:GOTO780
825 DF=1:PRINT" "SB$"   /   G
RAPHICS"
830 NEXTK,X:IFC=3THENGOSUB1295:G
OTO780 ELSEIFDF=1THEN780
835 PRINT" SORRY,  "NA$:PRINT" N
O GRAPHIC-ART FILES TO SCAN!":SC
=SC-5:GOTO780
840 PRINT:IF FLAG<1THENPRINT" SO
RRY, "NA$:PRINT" YOU MUST BECOME
 A MEMBER TO":PRINT" VIEW OUR GR
APHIC-ART FILES!":GOTO240
845 PRINT" OK, ENTER A GRAPHIC F
ILENAME ?":PRINT" ";
850 GOSUB1330:IFL>8 OR L<3THENGO
SUB1290:GOTO780 ELSE805
855 ' ------------------
860 ' user access board
865 ' ------------------
870 SC=SC-3:PRINT:PRINT:PRINT" =
==== USER ACCESS OPTIONS ====":P
RINT
875 PRINT:PRINT" < C D G H S X >
":GOSUB1385:C=INSTR("hscdgxX",CM
$):PRINT" "CM$:GOSUB1465:IFC=7TH
ENGOSUB985:GOTO870 ELSEON C GOTO
880,895,905,940,1635,240
880 GOSUB1355:PRINT"          ACCE
SS MENU HELP":PRINT:PRINT
885 PRINT" C) HANGE A PASSWORD":
PRINT" D) ISPLAY TRACER FILE":PR
INT" G) OODBYE / SIGN OFF":PRINT
" H) ELP / THIS BOARD":PRINT" S)
 CAN USERLOG FILE":PRINT" X) RET
URN TO MAIN":PRINT
890 GOSUB1355:SC=SC-15:GOTO875
895 GOSUB900:GOTO870
900 SC=SC-12:PRINT:GOSUB960:FORX
=1TO300:GET #1,X:IFPW$=STRING$(6
```

# *Still pounding away on that old keyboard?*

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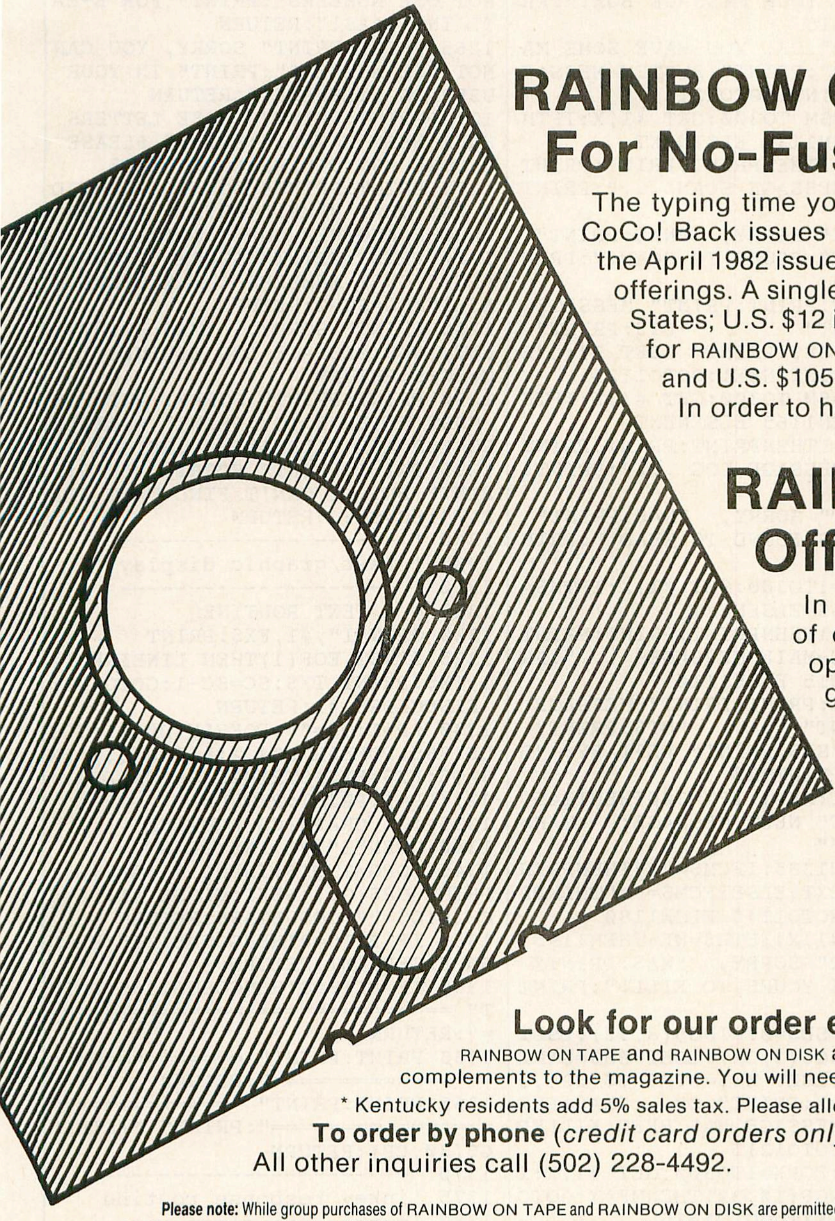

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```
,32)THENNEXT:GOTO955 ELSEPRINT"
"NM$"     <"IN$">":NEXT:GOTO955
905 PRINT:IF FLAG<1THENPRINT" SO
RRY, "NA$:PRINT" YOU DON'T HAVE
 A PASSWORD YET!":GOTO870
910 PRINT" CHANGE USER PASSWORD:
 <Y/N> ?":GOSUB1385
915 IFCM$<>"y"THENPRINT" NO":GOT
O870 ELSEPRINT" YES":PRINT:PRINT
" CURRENT PASSWORD:  ";:LP=1:Q$=
"":GOSUB1385:PRINT:P$=Q$:LP=0:IF
LEN(Q$)<>6THEN870
920 PRINT:GOSUB960:FORX=1TO300:G
ET #1,X:IFIN$=NL$ AND PW$=P$THEN
925 ELSENEXT:PRINT" SORRY, PASSW
ORD IS INCORRECT ?":GOTO935
925 PRINT" TO WHAT?  ENTER 6 NEW
 LETTERS!":PRINT" ";:LP=1:Q$="":
GOSUB1385:PRINT:P$=Q$:LP=0:IFLEN
(Q$)<>6THEN935
930 LSET PW$=P$:PUT #1,X:PRINT:P
RINT" YOUR PASSWORD IS NOW:  "P$
935 CLOSE #1:SC=SC-3:GOTO870
940 PRINT:IF FLAG<1THENPRINT" SO
RRY, THE SYSTEM TRACER FILE":PRI
NT" IS AN OPTION FOR MEMBERS ONL
Y!":SC=SC-2:GOTO870
945 PRINT" SYSTEM ACTIONS: "LG$:
SC=SC-4:GOTO870
950 MBR=0:GOSUB960:FORX=1TO300:G
ET #1,X:IFI$=IN$THEN MBR=1:GOTO9
55 ELSENEXT
955 CLOSE #1:SC=SC-2:RETURN
960 OPEN"D",#1,"USERLOG/SYS:"+UL
$,36:FIELD #1,10 AS LU$,16 AS NM
$,6 AS PW$,3 AS IN$,1 AS FL$
965 RETURN
970 ' --------------------
975 ' sysop access routine
980 ' --------------------
985 PRINT:PRINT:PRINT" HELLO, "
NA$:PRINT" THE SYSTEM OPERATOR I
S ONLINE!":X=0:PRINT
990 LINEINPUT" > ";S$:X=X+1:IFS$
<>""THEN990 ELSEPRINT" > GOODBYE
,  "NA$:SC=SC-X*5:RETURN
995 IFNL$<>"sop"AND NA$<>"sysop'
s name"THEN250 ELSEPRINT:LINEINP
UT" PASSWORD:  ";P$:IFP$<>"back
door"THENGOSUB1465:GOTO1660 ELSE
 LOAD"SYSOP/EDT",R
1000 ' ---------------------
1005 ' enter message routine
1010 ' ---------------------
1015 PRINT:CB=239:GOSUB1350:PRIN
T" ========= BBS WRITER ========
=":CC=PEEK(&H7D06):PRINT
1020 PRINT" OK, LEAVE YOUR MESSA
GE.  PRESS":PRINT" <ENTER> ON AN
 OPEN LINE TO END":PRINT" ROUTIN
E.  7 LINES MAXIMUM!  32":PRINT"
 CHARACTER LIMIT PER LINE ..."
1025 PRINT:PRINT" //////////////
////////////////":POKE&H7D06,143
:PRINT:M$="":C=7:Y=1
1030 LINEINPUTQ$:IFQ$=""THEN1055
 ELSEX=LEN(Q$)
1035 IFX=32THEN1045 ELSEIFX<32TH
ENQ$=Q$+STRING$(32-X,32):PRINT:G
OTO1045
1040 Q$=LEFT$(Q$,32):PRINT:PRINT
"- LINE#";Y:PRINTQ$
1045 M$=M$+Q$:IFY<7THENY=Y+1:PRI
NT"-";Y:GOTO1030 ELSEPRINT
1050 PRINT:PRINT" YOUR MESSAGE H
AS REACHED THE":PRINT" LIMIT!  S
AVE AS IS:  <Y/N> ?":GOTO1065
```

```
1055 IFM$=""THENPOKE&H7D06,CC:RE
TURN ELSEPRINT:PRINT
1060 PRINT" OK,  "NA$:PRINT" SAV
E MESSAGE TO DISC:  <Y/N> ?"
1065 POKE&H7D06,CC:SC=SC-Y*45:GO
SUB1375:IFCM$<>"y"THENPRINT" NO"
:RETURN ELSEIFLM=1THEN1220
1070 '----------------------
1075 'message log processing
1080 '----------------------
1085 OPEN"D",#1,"MESSLOG/SYS:"+M
L$,248:FIELD #1,10 AS DT$,8 AS S
B$,3 AS TH$,3 AS BH$,224 AS MS$
1090 IFSM<1 OR SM>299THENSM=1
1095 PRINT:ON C GOTO1105,1120,11
40,1155,1185,1200,1205
1100 GOTO1215
1105 FORX=1TO300:GET #1,X:IFTH$=
NL$THEN1115 ELSENEXT
1110 PRINT" SORRY,  "NA$:PRINT"
NO MAIL IN YOUR MESSAGE BOX!":PR
INT:GOTO1215
1115 PRINT" OK, YOU HAVE SOME MA
IL IN YOUR":PRINT" SYSTEM MESSAG
E BOX!":PRINT:GOTO1215
1120 FORX=SM TO300:GET #1,X:IFTH
$="ALL"THEN1135 ELSENEXT
1125 IFMK=1THENPRINT:PRINT:PRINT
" END OF MESSAGE SCAN ...":PRINT
:GOTO1215
1130 PRINT" SORRY,  "NA$:PRINT"
NO MESSAGES FOUND TO SCAN!":PRIN
T:GOTO1215
1135 PRINT:PRINT:PRINT" MESSAGE
#";X;:PRINT"           "DT$:PRINT"
SUBJECT: "SB$:PRINT" LEFT BY: "B
H$:MK=1:PRINT:NEXT:GOTO1125
1140 FORX=SM TO300:GET #1,X:IFTH
$="ALL"THEN1165 ELSENEXT
1145 IFMK=1THENPRINT:PRINT:PRINT
" END OF MESSAGE LOG ...":PRINT:
GOTO1215
1150 PRINT" SORRY,  "NA$:PRINT"
NO MESSAGES FOUND TO READ!":PRIN
T:GOTO1215
1155 FORX=1TO300:GET #1,X:IFTH$=
NL$THEN1165 ELSENEXT
1160 IFMK=1THENPRINT:PRINT:PRINT
" END OF E-MAIL MESSAGES ...":PR
INT:GOTO1215 ELSE1110
1165 PRINT:PRINT:PRINT" MESSAGE
#";X;:PRINT"           "DT$:PRINT"
SUBJECT: "SB$:PRINT" LEFT BY: "B
H$:PRINT:PRINTMS$
1170 PRINT:MK=1:IFX=300THEN1145
1175 PRINT" NEXT MESSAGE:  <Y/N>
 ?  ":Q$=""
1180 GOSUB1385:IFCM$="y"THENPRIN
T" YES":NEXT ELSEIFCM$="n"THENPR
INT" NO":GOTO1145 ELSE1180
1185 GET #1,X:IFTH$=NL$THEN1195
1190 PRINT" SORRY,  "NA$:PRINT"
THAT'S NOT YOURS TO KILL!":PRINT
:GOTO1215
1195 LSET SB$=STRING$(8,32):LSET
 TH$=STRING$(3,32):LSET BH$=STRI
NG$(3,32):LSET MS$=STRING$(224,3
2):PUT #1,X:PRINT" OK,  "NA$:PRI
NT" YOUR MESSAGE HAS BEEN KILLED
!":PRINT:GOTO1215
1200 MF=0:FORX=1TO300:GET #1,X:I
FDT$=STRING$(10,32)THENMF=X:GOTO
1215 ELSENEXT:GOTO1215
1205 GET #1,MF:LSET DT$=DA$:LSET
 SB$=S$:LSET TH$=I$:LSET BH$=NL$
:LSET MS$=M$:PUT #1,MF
1210 PRINT" OK,  "NA$:PRINT" YOU
```

```
R MESSAGE HAS BEEN SAVED!"
1215 CLOSE #1:SM=0:MK=0:RETURN
1220 OPEN"D",#1,"EXITLOG/SYS:"+E
L$,250:FIELD #1,10 AS DT$,16 AS
NM$,224 AS MS$
1225 PRINT:IFLM=1THEN1235
1230 MF=0:FORX=1TO100:GET #1,X:I
FDT$=STRING$(10,32)THENMF=X:GOTO
1215 ELSENEXT:GOTO1215
1235 GET #1,MF:LSET DT$=DA$:LSET
 NM$=NA$:LSET MS$=M$:PUT #1,MF:G
OTO1210
1240 ' -------------------
1245 ' system message base
1250 ' -------------------
1255 NK=0:FORX=1TOLEN(I$):Y=ASC(
MID$(I$,X,1)):IF(Y>64 AND Y<91)O
R(Y>96 AND Y<123)THENNEXT:NK=1:R
ETURN ELSEIFKN=1THEN1265
1260 PRINT:PRINT" SORRY, YOU CAN
NOT USE NUMBERS":PRINT" FOR E-MA
IL INITIALS!":RETURN
1265 PRINT:PRINT" SORRY, YOU CAN
NOT USE NUMBERS":PRINT" IN YOUR
USERLOG FILENAME!":RETURN
1270 PRINT:PRINT" THOSE LETTERS
HAVE BEEN TAKEN!":PRINT" PLEASE
CHOOSE <3> OTHERS.":GOTO1565
1275 PRINT:PRINT" SOMEONE ALREAD
Y HAS THAT NAME!":PRINT" PLEASE
CHOOSE ANOTHER ONE.":GOTO1510
1280 PRINT:PRINT" SORRY,  "NA$:P
RINT" ONLY MEMBERS CAN RECIEVE M
AIL!":SC=SC-2:RETURN
1285 PRINT" SORRY,  "NA$:PRINT"
BUT, OUR MESSAGE LOG IS FULL!":S
C=SC-5:RETURN
1290 PRINT:PRINT" SORRY, BUT YOU
 MUST ENTER 3 TO":PRINT" 8 LETTE
RS FOR ALL FILENAMES!":RETURN
1295 PRINT:PRINT" SORRY,  "NA$:P
RINT" BUT, I CAN'T FIND THAT FIL
E ?":SC=SC-3:RETURN
1300 ' --------------------
1305 ' text/graphic display
1310 ' --------------------
1315 '   TEXT ROUTINE
1320 OPEN"I",#1,FX$:PRINT
1325 IFNOT EOF(1)THEN LINEINPUT#
1,TX$:PRINT TX$:SC=SC-1:GOTO1325
 ELSECLOSE #1:RETURN
1330 LP=1:Q$="":POKE&H7D04,1:GOS
UB1385:POKE&H7D04,2:L=LEN(Q$):FX
$=Q$:FX$=FX$+STRING$(8-LEN(FX$),
32):LP=0:PRINT:RETURN
1335 '   GRAPHICS ROUTINE
1340 OPEN"I",#1,FX$:PRINT
1345 FORG=1TO16:INPUT #1,GR$(G):
PRINT GR$(G);:NEXT:CLOSE #1:SC=S
C-16:Q$="":GOSUB1385:RETURN
1350 IF BITS=8THENGOSUB1365:RETU
RN ELSEPRINT:RETURN
1355 IF BITS=8THENGOSUB1365:PRIN
T" =============================
=":RETURN
1360 PRINT:PRINT" ==============
================":RETURN
1365 PRINT:PRINT" ==============
================":PRINT" "+STRIN
G$(30,CB):RETURN
1370 '----------------------
1375 'inkey response routine
1380 '----------------------
1385 TIMER=0:SC=SC-1:RS=0
1390 CM$=INKEY$:LQ=LEN(Q$):IFCM$
=CHR$(8)AND LQ<1THENCM$=""
1395 IFCM$=""THEN1415 ELSETIMER=
0:RS=0:IFCM$=CHR$(8)THEN1410 ELS
EIFLP=1THEN1400 ELSERETURN
1400 IFCM$<>CHR$(13)THENQ$=Q$+CM
$:PRINTCM$; ELSERETURN
1405 IFLQ<17THEN1390 ELSERETURN
1410 Q$=LEFT$(Q$,LEN(Q$)-1):PRIN
TCHR$(8);:GOTO1390
1415 IFTIMER<60THEN1390
1420 TIMER=0:RS=RS+1:SC=SC-1:IFS
C<1THEN1445 ELSEIFLP=1THEN1440
1425 IFSC<TW THENPRINT:PRINT" SO
RRY,  "NA$:PRINT" BUT YOUR TIME
IS ALMOST GONE!":TW=0
1430 IFRS=60THENPRINT:PRINT" YOU
 MUST RESPOND IN 30 SECONDS":PRI
NT" "NA$"..."
1435 IFRS<90THEN1390 ELSE1445
1440 IFRS<150THEN1390
1445 IFSO=1THEN1660 ELSE1635
1450 ' ------------------
1455 ' actslog processing
1460 ' ------------------
1465 IFCM$=CHR$(13)THENCM$="?"
1470 AC=LEN(LG$)+LEN(CM$):IFAC>2
53THENLG$=LEFT$(LG$,253):CLOSE #
1:GOSUB1480:AL=AL+1:CM$=NL$
1475 LG$=LG$+CM$+" ":RETURN
1480 IFAL>150THENAL=1
1485 OPEN"D",#1,"ACTSLOG/SYS:"+A
L$:WRITE #1,LG$:PUT #1,AL:CLOSE
#1:LG$=" ":RETURN
1490 ' -------------------
1495 ' guest logon routine
1500 ' -------------------
1505 PRINT:PRINT:PRINT" ====== G
UEST ACCESS LOG ======":GOSUB960
:PRINT
1510 PRINT:PRINT" FIRST NAME:  "
;:KN=1:LP=1
1515 Q$="":GOSUB1385:IFLEN(Q$)<3
THEN1510 ELSEPRINT:FR$=Q$:I$=Q$:
GOSUB1255:IFNK<>1THEN1510
1520 PRINT:PRINT" LAST NAME:   "
;:Q$="":GOSUB1385:IFLEN(Q$)<3THE
N1520 ELSEPRINT:LS$=Q$:I$=Q$:GOS
UB1255:IFNK<>1THEN1520
1525 NA$=FR$+" "+LS$:LS$="":IFLE
N(NA$)<17THEN1535
1530 PRINT:PRINT" SORRY, BUT A U
SERLOG FILENAME":PRINT" CANNOT E
XCEED 16 LETTERS!":GOTO1510
1535 FORX=1TO300:GET #1,X:IFLEFT
$(NM$,LEN(NA$))=NA$THEN1275 ELSE
NEXT:PRINT:PRINT
1540 PRINT" DO YOU WANT TO BECOM
E A MEMBER":PRINT" OF THIS BBS B
OARD:  <Y/N> ?":KN=0:LP=0:GOSUB1
385:IFCM$<>"y"THENPRINT" NOT YET
":FLAG=0:GOTO1600
1545 PRINT" YES":PRINT:PRINT:FOR
X=1TO300:GET#1,X:IFPW$=STRING$(6
,32)THENMF=X:GOTO1560 ELSENEXT:P
RINT" SORRY,  "NA$:PRINT" BUT OU
R USERLOG FILE IS FULL!"
1550 PRINT" PLEASE DON'T HANG UP
, BUT FEEL":PRINT" FREE TO USE O
UR BBS; AND LEAVE":PRINT" A SYSO
P MESSAGE AT SIGN OFF!":FLAG=0
1555 GOTO1600
1560 PRINT" !!! <GREAT> !!!"
1565 PRINT:PRINT" ENTER <3> INIT
IALS FOR YOUR E-":PRINT" MAIL,
"NA$":  ";:LP=1:Q$="":GOSUB1385
1570 PRINT:I$=Q$:IFLEN(Q$)<>3THE
N1565 ELSEIFQ$="sop"THEN1270
1575 GOSUB1255:IFNK<>1THEN1565
1580 FORX=1TO300:GET #1,X:IFIN$=
I$THEN1270 ELSENEXT:TR=1
1585 PRINT:PRINT" PASSWORD?  YO
U MUST ENTER <6>":PRINT" LETTERS
, PLEASE:  ";:Q$="":POKE&H7D03,8
8:GOSUB1385:POKE&H7D03,0:PRINT:P
$=Q$:IFLEN(Q$)=6THEN1590 ELSETR=
TR+1:IFTR=4THEN1635 ELSE1585
1590 LSET LU$=DA$:LSET NM$=NA$:L
SET PW$=P$:LSET IN$=I$:LSET FL$=
"C":PUT #1,MF
1595 FLAG=1:NL$=I$:PRINT:PRINT"
YOUR GUEST USER NUMBER IS:";MF
1600 CLOSE #1:LP=0:PRINT:GOSUB13
60:PRINT:PRINT:PRINT" DATA BITS:
 <7/8=COLOR> ?"
1605 GOSUB1385:BITS=VAL(CM$):IF
BITS<7 OR BITS>8THEN1605
1610 PRINT BITS:GOSUB1355
1615 FX$="NEW-MBR/SXT":GOSUB1320
:GOTO215
1620 ' -----------------
1625 ' goodbye: sign off
1630 ' -----------------
1635 CLOSE #1:GOSUB1480:IFSC<450
THENSC=450:SO=1:LP=0
1640 PRINT:CB=255:GOSUB1350:PRIN
T" ========= SIGN OFF ========
=":PRINT:IFLM=1THEN1660
1645 PRINT:PRINT" DO YOU WANT TO
 LEAVE A MESSAGE":PRINT" FOR THE
 SYSOP:  <Y/N> ?":GOSUB1385:IFCM
```

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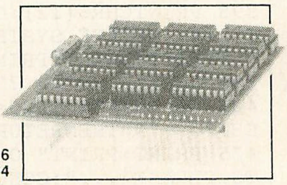

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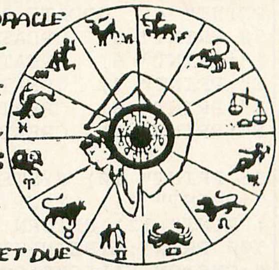

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```
$<>"y"THENPRINT" NO":GOTO1660
1650 PRINT" YES":GOSUB1220:IFMF<
1THENGOSUB1285:GOTO1660
1655 LM=1:GOSUB1015:GOTO1640
1660 PRINT:PRINT" GOODBYE,  "NA$
:PRINT" THANKS FOR CALLING ...":
FORX=1TO4:PRINT:NEXT:TIMER=0
1665 IFTIMER<200THEN1665 ELSEPRI
NT" +++";:TIMER=0
1670 IFTIMER<200THEN1670 ELSEPRI
NT"ATH";:TIMER=0
1675 IFTIMER<500THEN1675 ELSE MO
TORON:FORX=1TO200:NEXT:MOTOROFF:
FORX=1TO400:NEXT:GOTO105
1680 ' ----------------------
1685 ' the motoron / motoroff
1690 ' routine must be linked
1695 ' to your telephone line
1700 ' through cassette input
1705 ' ----------------------
1710 ' END OF SYSTEM
```

| | | | |
|---|---|---|---|
| 95 | 199 | 615 | 62 |
| 155 | 110 | 700 | 189 |
| 250 | 78 | 780 | 74 |
| 320 | 112 | 870 | 34 |
| 400 | 209 | 935 | 25 |
| 460 | 71 | END | 178 |
| 550 | 35 | | |

**Listing 3:** SYSOP.EDT

```
10 ' ------------------------
15 '   sysop access program
20 ' bbs-bord bulletin system
25 ' ------------------------
30 CLEAR4000:PRINTCHR$(12):CLS
35 IP=PEEK(&H7D04):OP=PEEK(&H7D0
5):POKE &H7D04,0:POKE &H7D05,0
40 PRINT:PRINT"  *** SYSOP ACCES
S PROGRAM ***":PRINT:PRINT
45 LINEINPUT" ACTSLOG DRIVE:  <0
/3> ?  ";AL$:IFAL$=""THENAL$="0"
50 LINEINPUT" USERLOG DRIVE:  <0
/3> ?  ";UL$:IFUL$=""THENUL$="0"
55 LINEINPUT" MESSLOG DRIVE:  <0
/3> ?  ";ML$:IFML$=""THENML$="0"
60 LINEINPUT" EXITLOG DRIVE:  <0
/3> ?  ";EL$:IFEL$=""THENEL$="0"
65 ' ------------------
70 ' sysop program menu
75 ' ------------------
80 PRINT:PRINT:PRINT"  *** SYSOP
 ACCESS PROGRAM ***":PRINT
85 PRINT" 1)  EXIT TO DISK BASIC
":PRINT" 2)  PRINT ACTSLOG FILE"
:PRINT" 3)  PRINT USERLOG FILE":
PRINT" 4)  UPDATE ACTSLOG FILE"
90 PRINT" 5)  UPDATE MESSLOG FIL
E":PRINT" 6)  CREATE ACTSLOG FIL
E":PRINT" 7)  CREATE USERLOG FIL
E":PRINT" 8)  CREATE MESSLOG FIL
E":PRINT" 9)  CREATE EXITLOG FIL
E"
95 PRINT" 10) SYSTEM FILE EDITOR
":PRINT" 11) SYSOP LOG REVISION"
:PRINT" 12) RETURN TO BBS-BORD"
100 PRINT:LINEINPUT"  COMMAND:
";CM$:ON VAL(CM$)GOSUB980,125,30
0,240,340,205,585,755,885,460,92
5,975
105 GOTO80
110 ' ------------------
115 ' print actslog file
120 ' ------------------
125 PRINTCHR$(12):CLS:PRINT:PRIN
T"   *** PRINT ACTSLOG FILE ***"
130 PRINT:PRINT:PRINT" OUTPUT TO
 SCREEN OR PRINTER:":LINEINPUT"
<S> OR <P>    <ENTER=S> ? ";Q$
135 IFQ$="P"THENDV=-2 ELSEDV=0
140 PRINT:LINEINPUT" START NUMBE
R:  <ENTER=1> ? ";S$:RC=VAL(S$)
145 IF RC<1 OR RC>150THEN RC=1
150 OPEN"D",#1,"ACTSLOG/SYS:"+AL
$
155 GET #1,RC:INPUT#1,LG$:IFLEFT
$(LG$,3)=STRING$(3,32)THEN180
160 PRINT#DV," ACTSLOG RECORD:
#";RC:PRINT#DV:IF DV=0THENPRINT
LG$:GOTO170
165 LG$=LG$+STRING$(253-LEN(LG$)
,32):A$=LEFT$(LG$,64):B$=MID$(LG
$,65,64):C$=MID$(LG$,129,64):D$=
RIGHT$(LG$,61):PRINT#DV,A$:PRINT
#DV,B$:PRINT#DV,C$:PRINT#DV,D$
170 PRINT:PRINT" NEXT RECORD:  <
Y/N> ?"
175 Q$=INKEY$:IFQ$="Y"THEN180 EL
SEIFQ$="N"THEN185 ELSE175
180 RC=RC+1:IF RC<151THEN155
185 CLOSE #1:RETURN
190 ' -------------------
195 ' create actslog file
200 ' -------------------
205 PRINTCHR$(12):CLS:PRINT:PRIN
T"  *** CREATE ACTSLOG FILE ***"
:PRINT:PRINT:PRINT:PRINT" ARE YO
U SURE:  <Y/N> ?"
210 Q$=INKEY$:IFQ$="Y"THEN215 EL
SEIFQ$="N"THENRETURN ELSE210
215 PRINT:PRINT" OK, CREATING AC
TSLOG FILE ..."
220 GOSUB275:PRINT" THE LOG WILL
 HOLD 150 RECORDS!":GOTO615
225 ' -------------------
230 ' update actslog file
235 ' -------------------
240 PRINTCHR$(12):CLS:PRINT:PRIN
T"  *** KILL ACTSLOG RECORDS ***
":PRINT:PRINT:PRINT
245 PRINT" RECORD NUMBER:  <1-15
0>  ?":LINEINPUT" ENTER = ABORT
 <A=ALL>  ";Q$:RC=VAL(Q$)
250 IFQ$="A"THEN270
255 IF RC<1 OR RC>150THENRETURN
260 OPEN"D",#1,"ACTSLOG/SYS:"+AL
$:GET #1,RC:WRITE #1,STRING$(253
,32):PUT #1,RC:CLOSE #1
265 PRINT:PRINT" OK, THAT ENTRY
IS NOW DELETED!";:GOTO615
270 GOSUB275:PRINT:PRINT" OK, AL
L RECORDS NOW DELETED!":GOTO615
275 OPEN"D",#1,"ACTSLOG/SYS:"+AL
$:FORX=1TO150:WRITE #1,STRING$(2
53,32):PUT #1,X:NEXT:CLOSE #1
280 RETURN
285 ' ------------------
290 ' print userlog file
295 ' ------------------
300 PRINTCHR$(12):CLS:PRINT:PRIN
T"   *** PRINT USERLOG FILE ***"
305 PRINT:PRINT:PRINT" OUTPUT TO
 SCREEN OR PRINTER:":LINEINPUT"
<S> OR <P>    <ENTER=S> ? ";Q$
310 IFQ$="P"THENDV=-2 ELSEDV=0
315 PRINT:GOSUB950:FORX=1TO300:G
ET #1,X:IF PW$=STRING$(6,32)THEN
NEXT:GOTO320 ELSEPRINT#DV," "+NM
$+" <"+IN$+">  "+PW$:NEXT
320 CLOSE #1:GOTO615
325 ' -------------------
330 ' update messlog file
335 ' -------------------
340 PRINTCHR$(12):CLS:PRINT:PRIN
T"  *** UPDATE MESSLOG FILE ***"
:PRINT:PRINT:PRINT:PRINT" ENTER
YOUR CHOICE:  <1/2> ?"
345 PRINT:PRINT" 1.  KILL SYSTEM
 MESSAGES":PRINT" 2.  UPDATE SYS
TEM MESSAGES"
350 Q$=INKEY$
355 ON VAL(Q$)GOTO365,395
360 GOTO350
365 PRINTCHR$(12):CLS:PRINT:PRIN
T"  *** KILL SYSTEM MESSAGES ***
":PRINT:PRINT:PRINT
370 PRINT" ENTER THE FIRST <3> L
ETTERS OF":LINEINPUT" THE MONTH
TO DELETE:  ";DL$:IF LEN(DL$)<>3
THENRETURN ELSEGOSUB960
375 FOR RC=1TO300:GET #1,RC:IFLE
FT$(DT$,3)=DL$THEN390 ELSENEXT
380 PRINT:IF KM=1THENPRINT" OK,
THAT MONTH IS NOW DELETED!":GOTO
385 ELSEPRINT" SORRY, CAN'T FIND
 THAT MONTH!"
385 CLOSE #1:KM=0:GOTO615
390 GOSUB945:KM=1:NEXT:GOTO380
395 PRINTCHR$(12):CLS:PRINT:PRIN
T" *** UPDATE SYSTEM MESSAGES **
*":PRINT:PRINT:PRINT:PRINT" ARE
YOU SURE:  <Y/N> ?"
400 Q$=INKEY$:IFQ$="Y"THEN405 EL
SEIFQ$="N"THENRETURN ELSE400
405 PRINT:PRINT" OK, A FEW MOMEN
TS PLEASE ...":GOSUB960
410 FOR SM=1TO300:GET #1,SM:IFTH
$=STRING$(3,32)THEN420 ELSENEXT
415 GOTO440
420 MF=SM+1:FORX=MF TO300:GET #1
,X:IFTH$<>STRING$(3,32)THEN430
425 IFDT$<>STRING$(10,32)THEN LS
ET DT$=STRING$(10,32):PUT #1,X:N
EXT:GOTO440 ELSENEXT:GOTO440
430 DU$=DT$:SU$=SB$:TU$=TH$:BU$=
BH$:MU$=MS$:LSET DT$=STRING$(10,
32):LSET SB$=STRING$(8,32):LSET
TH$=STRING$(3,32):LSET BH$=STRIN
G$(3,32):LSET MS$=STRING$(224,32
):PUT #1,X
435 GET #1,SM:LSET DT$=DU$:LSET
SB$=SU$:LSET TH$=TU$:LSET BH$=BU
$:LSET MS$=MU$:PUT #1,SM:SM=SM+1
:IF SM<300THEN420
440 CLOSE #1:PRINT" THE MESSLOG
HAS BEEN UPDATED!":GOTO615
445 ' ----------------
450 ' system log editor
455 ' ----------------
460 PRINTCHR$(12):CLS:PRINT:PRIN
```

```
T"    *** SYSTEM LOG EDITOR ***":
PRINT:PRINT:PRINT" ENTER FILE NU
MBER:  <1/3> ?":RC=1:PRINT
465 PRINT" 1.  USERLOG / SYS"
470 PRINT" 2.  MESSLOG / SYS"
475 PRINT" 3.  EXITLOG / SYS"
480 Q$=INKEY$:ON VAL(Q$)GOTO505,
645,805
485 GOTO480
490 ' -----------------
495 ' edit userlog file
500 ' -----------------
505 GOSUB950:PRINTCHR$(12)
510 CLS:GET #1,RC:PRINT:PRINT" R
ECORD #"RC:PRINT:PRINT
515 PRINT" USERNAME:  "NM$:PRINT
" PASSWORD:  "PW$:PRINT" INITIAL
S:  "IN$:PRINT" USERFLAG:  "FL$:
PRINT" LAST USE:  "LU$:PRINT
520 PRINT:PRINT" 1. NAME  2. PSW
ORD  3. INIT":PRINT" 4. FLAG  5.
 DELETE  6. NEXT":PRINT" 7. BACK
 8. RETURN TO MAIN.":PRINT
525 Q$=INKEY$:ON VAL(Q$)GOTO535,
540,545,550,555,560,570,575
530 GOTO525
535 LINEINPUT" USERNAME:  ";N$:L
SET NM$=N$:PUT #1,RC:GOTO510
540 LINEINPUT" PASSWORD:  ";P$:L
SET PW$=P$:PUT #1,RC:GOTO510
545 LINEINPUT" INITIALS:  ";I$:L
SET IN$=I$:PUT #1,RC:GOTO510
550 LINEINPUT" USERFLAG:  ";F$:L
SET FL$=F$:PUT #1,RC:GOTO510
555 LSET LU$=STRING$(10,32):LSET
 NM$=STRING$(16,32):LSET PW$=STR
ING$(6,32):LSET IN$=STRING$(3,32
):LSET FL$=" ":PUT #1,RC:GOTO510
560 RC=RC+1:IF RC<301THEN510
565 GOTO575
570 RC=RC-1:IF RC>0THEN510
575 CLOSE #1:RETURN
580 ' -------------------
585 ' create userlog file
590 ' -------------------
595 PRINTCHR$(12):CLS:PRINT:PRIN
T"  *** CREATE USERLOG FILE ***"
:PRINT:PRINT:PRINT:PRINT" ARE YO
U SURE:  <Y/N> ?"
600 Q$=INKEY$:IFQ$="Y"THEN605 EL
SEIFQ$="N"THENRETURN ELSE600
605 PRINT:PRINT" OK, CREATING US
ERLOG FILE ...":GOSUB950
610 FORX=1TO300:LSET LU$=STRING$
(10,32):LSET NM$=STRING$(16,32):
LSET PW$=STRING$(6,32):LSET IN$=
STRING$(3,32):LSET FL$=" ":PUT #
1,X:NEXT:CLOSE #1:PRINT" THE FIL
E WILL HOLD 300 USERS!"
615 PRINT:PRINT" PRESS ANY KEY .
.."
620 IF INKEY$=""THEN620
625 RETURN
630 ' -----------------
635 ' edit messlog file
640 ' -----------------
645 GOSUB960:PRINTCHR$(12)
650 CLS:GET #1,RC:PRINT" RECORD
#";RC;:PRINT"          "DT$:PRINT
655 PRINT" SUBJECT:  "SB$:PRINT"
 FOR WHO:  "TH$:PRINT" LEFT BY:
 "BH$:PRINT:PRINT MS$
660 PRINT:PRINT"  <PRESS ANY KEY
 FOR OPTIONS>";
665 IF INKEY$=""THEN665
670 PRINT:PRINT:PRINT" 1. PRINTE
R  2. SUBJ  3. TO WHO":PRINT" 4.
 FROM  5. MESSAGE  6. DATE":PR
INT" 7. DELETE  8. NEXT  9. RETU
RN.";
675 Q$=INKEY$:ON VAL(Q$)GOTO685,
695,705,715,730,725,735,740,745
680 GOTO675
685 GOSUB940:PRINT#DV,"SUBJECT:
 "+SB$:PRINT#DV,"FOR WHO:   "+T
H$:PRINT#DV,"LEFT BY:   "+BH$:PR
INT#DV:PRINT#DV,A$:PRINT#DV,B$:P
RINT#DV,C$:PRINT#DV,D$:PRINT#DV
690 GOTO650
695 PRINT:PRINT:LINEINPUT" SUBJE
CT:  ";S$:LSET SB$=S$:PUT #1,RC
700 GOTO650
705 PRINT:PRINT:LINEINPUT" TO WH
O:  ";I$:LSET TH$=I$:PUT #1,RC
710 GOTO650
715 PRINT:PRINT:LINEINPUT" LEFT
BY:  ";L$:LSET BH$=L$:PUT #1,RC
720 GOTO650
725 PRINT:PRINT:LINEINPUT" DATE:
 <MTH/DA/YR> ? ";D$:LSET DT$=D$
:PUT #1,RC:GOTO650
730 PRINT:PRINT:PRINT" MESSAGE:"
:PRINT:LINEINPUT M$:LSET MS$=M$:
PUT #1,RC:GOTO650
735 GOSUB945:GOTO650
740 RC=RC+1:IF RC<301THEN650
745 CLOSE #1:RETURN
750 ' -------------------
755 ' create messlog file
760 ' -------------------
765 PRINTCHR$(12):CLS:PRINT:PRIN
```

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```
T"  *** CREATE MESSLOG FILE ***"
:PRINT:PRINT:PRINT:PRINT" ARE YO
U SURE:  <Y/N> ?"
770 Q$=INKEY$:IFQ$="Y"THEN775 EL
SEIFQ$="N"THENRETURN ELSE770
775 PRINT:PRINT" OK, CREATING ME
SSLOG FILE ...":GOSUB960
780 FORX=1TO300:LSET DT$=STRING$
(10,32):LSET SB$=STRING$(8,32):L
SET TH$=STRING$(3,32):LSET BH$=S
TRING$(3,32):LSET MS$=STRING$(22
4,32):PUT #1,X:NEXT
785 CLOSE #1:PRINT" THE LOG WILL
 HOLD 300 RECORDS!":GOTO615
790 ' -----------------
795 ' edit exitlog file
800 ' -----------------
805 GOSUB970
810 PRINTCHR$(12):CLS:GET #1,RC:
PRINT:PRINT" RECORD #";RC;:PRINT
"       "DT$:PRINT
815 PRINT" USRNAME:  "NM$:PRINT"
 MESSAGE:":PRINT:PRINT MS$
820 PRINT" 1. PRINTER  2. DELETE
  3. NEXT":PRINT" 4. GO BACK  5.
 RETURN TO MAIN.";
825 Q$=INKEY$:ON VAL(Q$)GOTO835,
845,850,860,865
830 GOTO825
835 GOSUB940:PRINT#DV,"USRNAME:
  "+NM$:PRINT#DV,"MESSAGE:":PRIN
T#DV:PRINT#DV,A$:PRINT#DV,B$:PRI
NT#DV,C$:PRINT#DV,D$:PRINT#DV
840 GOTO810
845 LSET DT$=STRING$(10,32):LSET
 NM$=STRING$(16,32):LSET MS$=STR
ING$(224,32):PUT #1,RC:GOTO810
850 RC=RC+1:IF RC<101THEN810
855 GOTO865
860 RC=RC-1:IF RC>0THEN810
865 CLOSE #1:RETURN
870 ' ------------------
875 ' create exitlog file
880 ' ------------------
885 PRINTCHR$(12):CLS:PRINT:PRIN
T"  *** CREATE EXITLOG FILE ***"
:PRINT:PRINT:PRINT:PRINT" ARE YO
U SURE:  <Y/N> ?"
890 Q$=INKEY$:IFQ$="Y"THEN895 EL
SEIFQ$="N"THENRETURN ELSE890
895 PRINT:PRINT" OK, CREATING EX
ITLOG FILE ...":GOSUB970
900 FORX=1TO100:LSET DT$=STRING$
(10,32):LSET NM$=STRING$(16,32):
LSET MS$=STRING$(224,32):PUT #1,
X:NEXT:CLOSE #1
905 PRINT" THE LOG WILL HOLD 100
 RECORDS!":GOTO615
910 ' ------------------
915 ' sysop log revision
920 ' ------------------
925 PRINTCHR$(12):CLS:PRINT:PRIN
T"   *** SYSOP LOG REVISION ***"
:PRINT:PRINT:PRINT:LINEINPUT" DA
TE:  <MTH/DA/YR>  ";D$:PRINT
930 LINEINPUT" SYSOP NAME:  ";N$
:LINEINPUT" INITIALS:    ";I$:LI
NEINPUT" PASSWORD:    ";P$
935 GOSUB950:GET #1,1:LSET LU$=D
$:LSET NM$=N$:LSET PW$=P$:LSET I
N$=I$:LSET FL$="A":PUT #1,1:CLOS
E #1:PRINT:PRINT" OK, SYSOP'S LO
G IS NOW REVISED!";:GOTO615
940 DV=-2:R$=STR$(RC):A$=LEFT$(M
S$,56):B$=MID$(MS$,57,56):C$=MID
$(MS$,113,56):D$=RIGHT$(MS$,56):
PRINT#DV,"RECORD:     #"+R$+"
        "+DT$:PRINT#DV:RETURN
945 LSET DT$=STRING$(10,32):LSET
 SB$=STRING$(8,32):LSET TH$=STRI
NG$(3,32):LSET BH$=STRING$(3,32)
:LSET MS$=STRING$(224,32):PUT #1
,RC:RETURN
950 OPEN"D",#1,"USERLOG/SYS:"+UL
$,36:FIELD #1,10 AS LU$,16 AS NM
$,6 AS PW$,3 AS IN$,1 AS FL$
955 RETURN
960 OPEN"D",#1,"MESSLOG/SYS:"+ML
$,248:FIELD #1,10 AS DT$,8 AS SB
$,3 AS TH$,3 AS BH$,224 AS MS$
965 RETURN
970 OPEN"D",#1,"EXITLOG/SYS:"+EL
$,250:FIELD #1,10 AS DT$,16 AS N
M$,224 AS MS$:RETURN
975 POKE &H7D04,IP:POKE &H7D05,O
P:LOAD "BBS-BORD/SYS",R
980 POKE 113,0:EXEC 40999
985 ' --------------
990 ' end of program
```

95 ........10
160 .......86
270 .......30
END .....211

**Listing 4:** TEXTGEN.EDT

```
10 ' ------------------------
15 '    text file processor
20 ' bbs-board bulletin system
25 ' ------------------------
30 CLEAR 5000:DIM TX$(500)
35 CLS:PRINT@34,"*** TEXT FILE P
ROCESSOR ***":PRINT:PRINT
40 PRINT" DO YOU WANT TO START A
 FILE OR":PRINT" EDIT AN EXISTIN
G ONE:  <S/E> ?"
45 Q$=INKEY$:IFQ$="E"ORQ$="S"THE
N50 ELSE45
50 PRINT:LINEINPUT" ENTER FILENA
ME:  ";FL$
55 IF LEN(FL$)>8THEN50
60 PRINT:LINEINPUT" EXTENSION NA
ME:  ";XT$
65 IF LEN(XT$)=3THEN85 ELSE60
70 ' ----------------------
75 ' directory verification
80 ' ----------------------
85 FX$=FL$+"/"+XT$:PRINT:PRINT"
CHECKING THE DISK DIRECTORY:":PR
INT" JUST A MOMENT, PLEASE ..."
90 CK=0:FORX=3TO11:DSKI$0,17,X,A
$,B$:A$=A$+LEFT$(B$,120):FORK=0T
O7:SB$=MID$(A$,K*32+1,8):XS$=MID
$(A$,K*32+9,3):Y=ASC(SB$):IF Y=2
55THEN K=7:X=11:GOTO105
95 IFRIGHT$(SB$,1)=" "THENSB$=LE
FT$(SB$,LEN(SB$)-1):GOTO95
100 DF$=SB$+"/"+XS$:IFDF$=FX$THE
N CK=1:K=7:X=11
105 NEXTK,X:IFQ$="E"THEN120
110 IF CK<1THEN140
115 CLS:PRINT@33,"SORRY, BUT THA
T FILENAME NOW":PRINT" EXISTS ON
 YOUR DISK!  PLEASE":PRINT" CHOO
SE ANOTHER NAME ...":GOTO50
120 IF CK=1THEN255 ELSEPRINT:PRI
NT" SORRY, I CAN'T FIND THAT FIL
E!":FORX=1TO3500:NEXT:GOTO35
125 ' ------------------
130 ' textfile processor
135 ' ------------------
140 CLS:PRINT@33,"======= TEXT P
ROCESSOR =======":PRINT
145 PRINT" OK, CREATE YOUR TEXT
PROGRAM!":PRINT" PRESS <ENTER> O
N AN OPEN LINE":PRINT" FOR INPUT
 COMMANDS WHEN READY."
150 X=1:PRINT:PRINT" ///////////
/////////////////////":PRINT
155 M$="":GOSUB200:PRINT:IFM$=""
THEN165 ELSETX$(X)=M$:IF X<500TH
EN X=X+1:PRINT"-";X:GOTO155
160 PRINT:PRINT" YOU HAVE REACHE
D THE LIMIT OF":PRINT" TEXT DIME
NSION:  SAVE <Y/N> ?":GOTO170
165 IF X<2THEN230 ELSEPRINT:PRIN
T" SAVE FILE TO DISK:  <Y/N> ?"
170 Q$=INKEY$:IFQ$="Y"THEN175 EL
SEIFQ$="N"THEN230 ELSE170
175 OPEN"O",#1,FX$:FORY=1TO X:PR
INT #1,TX$(Y):NEXT:CLOSE #1
180 PRINT:PRINT" OK, "FX$:PRINT"
 HAS NOW BEEN SAVED ...":GOTO230
185 ' -----------------
190 ' inkey$ subroutine
195 ' -----------------
200 Q$=INKEY$:IFQ$=CHR$(8)AND M$
=""THENQ$=""
205 IFQ$=""THEN200
210 IFQ$=CHR$(8)THEN225
215 IFQ$=CHR$(13)THENRETURN
220 M$=M$+Q$:PRINT Q$;:IF LEN(M$
)<31THEN200 ELSERETURN
225 M$=LEFT$(M$,LEN(M$)-1):PRINT
 Q$;:GOTO200
230 PRINT:PRINT" START ANOTHER F
ILE:  <Y/N> ?"
235 Q$=INKEY$:IFQ$="Y"THEN35 ELS
EIFQ$="N"THEN325 ELSE235
240 ' ---------------
245 ' textfile editor
250 ' ---------------
255 CLS:PRINT@33,"====== TEXTFIL
E EDITOR ======="
260 PRINT@131,"THIS IS A BASIC L
INE EDITOR.":PRINT" YOU CAN REVI
SE ANY LINE WITHIN":PRINT" THE F
ILE, BUT YOU CAN'T ADD TO":PRINT
" OR DELETE LINES OF TEXT ..."
265 PRINT@353,"PRESS ANY KEY !"
270 IF INKEY$=""THEN270
275 OPEN"I",#1,FX$:Y=1
280 IFNOT EOF(1)THEN LINEINPUT #
1,TX$(Y):Y=Y+1:GOTO280
285 CLOSE #1:FORX=1TO Y:CLS:PRIN
T@34,"*** EDIT LINE:";X;:PRINT"
<Y/N> ***":PRINT:PRINT"-
                          -";:PRINTT
X$(X):PRINT"-
           -";
290 Q$=INKEY$:IFQ$="Y"THEN305 EL
SEIFQ$="N"THEN295 ELSE290
295 IFTX$(X)=""THEN320 ELSEPRINT
:PRINT"  *** EXIT OR NEXT:  <E/N
> ***"
300 Q$=INKEY$:IFQ$="E"THEN315 EL
SEIFQ$="N"THENNEXT ELSE300
305 PRINT"  *** OK, ENTER A NEW
LINE ***":PRINT"-
                      -";:M$="":GOSUB20
0:IFM$=""THENM$=STRING$(31,32)
310 TX$(X)=M$:X=X-1:NEXT
315 IFTX$(Y)=""THEN Y=Y-1:GOTO31
5 ELSEPRINT:X=Y+1
320 PRINT:PRINT" RESAVE FILE TO
DISK:  <Y/N> ?":GOTO170
325 POKE 113,0:EXEC 40999
330 ' --------------
335 ' end of program
```

# ASCII For It

### By Joseph Kolar
### Rainbow Contributing Editor

The special keys that mark the CoCo 3 as being uniquely different from its older brothers are intriguing. They are not discussed in the manual, and a challenge builds to a crescendo to find some use for them in BASIC programs.

Our quest becomes one of discovering the ASCII value of each key and verifying it by creating a small routine. We'll call on CoCo's `ASC` function to convert a character or string variable into an ASCII decimal number. Here's a small program to do it:

```
10 A$=INKEY$:IF A$="" GOTO10
20 X=ASC(A$)
30 PRINT A$;X,
40 GOTO10
```

Run the program and save it to tape or disk.

We decide to use `INKEY$` to read a character from the keyboard. Line 10, a multiple-line statement, uses statements that go together like baloney and bread. Expect to use some version of them in tandem when `INKEY$` situations arise. You should memorize the line and write it down as a frequently used convention in your reference notebook.

Line 20 gives `X` the variable that will provide the ASCII number of the key struck. Line 30 displays the name of the key pressed and its corresponding ASCII number. A few keys (space bar, ENTER, CLEAR, etc.) will display only the ASCII number. This indicates that the key performs some task other than representing a visible character.

Run the program. Strike a few keys. Compare the values with the ASCII character tables in your manual.

Note that if a program has a `WIDTH32` statement indicating the Lo-Res screen, masking that program line with a `REM` statement usually allows older CoCos to accept the program. Older CoCos will balk at CoCo 3's special vocabulary, shrug their shoulders and cough up an SN Error, not understanding the new dialect.

We'll follow these assumptions in future tutorials: If `WIDTH32` occurs in a program line, the program was created on a CoCo 3 and is not necessarily understandable to older CoCos; if the program lacks this statement, the program was specifically created for older CoCos.

Fool around time!

Remove `A$;` from Line 30 and change the comma to a semicolon. Now run. Type your name. It looks like a primitive cipher. Make the code a bit more mystifying by adding a new line: `25 X=X+2`. Now run.

Type your name. This line was deliberately written to make all values from the older CoCo keyboard appear as double digits. The numbers fall neatly to display an elegant batch of numbers. The single-digit left arrow key (8) and right arrow key (9) do not louse up the march of double digits; they take the values 10 and 11, respectively. The highest value is 95, but who is likely to type a shifted up arrow?

Delete Line 25.

Without consulting the manual, you can determine the numeric value of the key pressed. You may want to devote some time at this stage to memorizing the values of the alphabet keys and any other keys that strike your imagination.

Now we have a method for determining the ASCII values of the rearranged arrow keys and other special CoCo 3 keys and can verify the observations with a color-coded display for each key.

Attention CoCo 3 owners! Using the `ASC` program you saved earlier, determine the values of ALT, CTRL, F1 and F2. Make a note of these values in your manual, and list the four shifted values of these keys as well. The value of shifted ALT is 19. You may have trouble getting this bashful number. Try tapping different combinations of ALT and CTRL.

Key in listing `SPECKEYS`.

Lines 1 through 5 look familiar. Line 10 asks CoCo to check and see if CTRL is pressed; if CoCo reports back that CTRL is being pressed, it is then instructed to color the screen black.

Run the program and press CTRL. Now check out the other keys. Notice that pressing any regular key produces a black screen.

Edit Line 100 (type `EDIT 100`) to change the screen color to buff (value of 5 is entered). Run the program and press CTRL. Now run again and press any regular key. Re-edit Line 100 to restore screen color to black (value of 0 is entered).

We verified that if we called the proper key by its ASCII number, we got a desired result. Incidentally, we found a use for these normally unused keys in BASIC — performing specific tasks. That is, CoCo was prodded to call specific colors.

---

*Florida-based Joseph Kolar is a veteran writer and programmer who specializes in introducing beginners to the powers of the Color Computer.*

Now save SPECKEYS to tape or disk.

To make each key pressed produce a different color in a perpetual loop, change Lines 100 to 400 to GOTO3, not letting them loop on themselves. Run.

To prove that CTRL gives black, add:

```
50 If X<>189 OR X<>103 OR X<>
   4 OR X<>64 GOTO500
500 CLS8:GOTO3
```

Run the program and press CTRL. Then press any regular key. Only CTRL will produce black. The regular keys will call for orange. Delete lines 50 and 500 and save the program as S1.

We will now inspect the shifted arrow keys and shifted CLEAR and assign the rest of the CLS Lo-Res colors.

From listing S1 add lines 50 through 90 and 500 through 900 to your working program. Run it. Press all nine keys in rotation. Save your modification as S.

The temptation to make the colors scroll automatically in sequence, beginning with the key pressed, is too strong to ignore.

From listing S2, add lines 2 and 2000. Edit lines 100 through 900 and make the required changes. Use this procedure:

Type EDIT100 and press X to jump to the end of the line. Backspace with the left arrow key three spaces. Type and enter SUB2000. And so forth. At Line 900 also add :GOTO2, run the program and press CTRL. If you press any regular key, you will get a full run-through. If you press one of the other eight targeted keys, only a partial run-through will be executed.

Now save our evolving labor of love as S2. The true newcomer can memorize the Lo-Res CLS color numbers by counting the colors as they scroll on the screen when using any regular key to tickle CoCo.

If you want the color display to recycle forever, change Line 900 to :GOTO4 and run.

Now let us see what is what when we change the width statement in Line 1 to WIDTH40. Upon making the change to a Hi-Res screen, we are dejected to get an HP Error in Line 2. Scrutinizing Line 2, we see that PRINT@ won't do. The line must be composed so that CoCo 3 makes sense out of it. Copy Line 2 from listing S3. Restore :GOTO2 in Line 900 and run. We cleared the screen to default colors and used LOCATE to place our legend on the 11th row, indenting 11 spaces. Rather than have the Hi-Res cursor hanging clumsily at the end of the directions, we lowered and centered it and used it as an accent. Notice that we lost black when we pressed CTRL or a regular key.

Time to panic! We thumb through our manual to discover to our dismay that CLS has no CLS0 color in Hi-Res. Well, we can live with that bit of distressing news.

We edit lines 100 to 800 and change the color in CLS. Delete Line 900, a superfluous line. At the end of Line 800, add :GOTO2. You may want to go back and correct the color names in lines 10 through 80. Delete Line 90 to avoid confusion.

Note in WIDTH40, using CLS, the entire screen is one color (background as well as foreground).

You know what a fetish I have about blank screens. They scream for treatment. My sterile brain salvaged the names from last month's tutorial and they translated into subroutine lines 1000 to 1300, which you key in.

Look at listing S3. In lines 100 and 500, insert GOSUB1200: and run. In lines 200 and 600, insert GOSUB1300: and run. In lines 300 and 700, insert GOSUB1000: and in lines 400 and 800, insert GOSUB1100: and run. The secret is out! Now you know where and with whom I hang out when my CoCo is in dry dock.

Change Line 2000 to shorten the delay to 500 ticks. Save our modification now as S3.

To make S3 work in Lo-Res on CoCo 3, we change Line 1 back to WIDTH32. Run. We get the anticipated HP Error in Line 2. Key in Line 2 from listing S4, along with lines 1000 to 1300; change GOTO2 to GOTO4 in Line 800 and run.

Entering 6 GOTO100 bypasses all the instructions to the special keys. Run. Now any key, including the special keys, will work. You might consider deleting lines 10 through 80, but I am a chicken and left them in the program even though the colors listed are wrong. Save again as S4.

The final experiment is to make a program especially for the earlier CoCos. (It's a good thing I didn't delete lines 10 through 80!) Enter DEL1, for openers.

From listing S5 key in Line 2. Run, and get the "no place for CoCo to go to" error message.

Key in lines 3000 and 3001 and run. Note the different techniques I must utilize to make my complete list.

Look at Line 3001. I started out using the PRINTTAB(x) system. Beginning at column 1, the color number was listed. Two blanks intervened and the color name printed out. This was separated between quotes with a comma. A leading space had to be inserted in front of number 1 to maintain column integrity.

And so it went without further incident, until the end of the program line. Since the 'W' in ARROW was at the right margin, trouble loomed. The PRINTTAB ploy was abandoned.

Key in lines 3002 and 3003. It was time to resort to the PRINT@ gambit. It was OK to shift to the right-hand key column with the comma between quotes, but CoCo nixed it because the 'W' was crowding the right margin. Another PRINT@ had to be utilized and from there it was clear sailing. RIGHT had to be abbreviated or it would have split and continued on the next row, ruining the columnar list. Run.

Edit lines 100 through 800, changing the CLS value beginning with zero. Delete :GOTO2 from the end of Line 800.

Enter 900 CLS8:GOSUB2000:GOTO2 and run.

Ah! That blank area!

Copy Line 1400 from S5 and insert after the color in Line 900. Enter GOSUB1400: and DEL6.

Edit lines 10 through 40, changing ASCII values and adding Line 90 from S5. Run.

Finally, re-edit lines 10 through 80, changing color and key name as necessary. Save the program with these modifications as S5.

This tutorial was fun to create. The only odd thing about it was that all those ASCII numbers and the keys they represent didn't do a thing for this program. This is not to say that their use is invalid, but, in S5 you could delete lines 10 through 90 and no harm would befall the program concept. Be careful if you want to chop up or mutilate an existing program just to satisfy your lust for brevity. You never know when you might want to refer to it. Delete it and it is gone forever, possibly taking the idea with it. My free advice is to be reluctant to delete a harmless portion of a working program. It is analogous to wiping out a program. There is an old adage: Five minutes after you destroy a program or delete a routine, guess what you are looking for.

Instead of deleting lines, bypass them or remark them. The program listing may look unnecessarily bulky, but so what? There is nobody standing over you with a clipboard, giving you bad marks.

I mentioned that the ASCII didn't do a thing for our final program. True, but the final program would never have been created without the impetus of the first explorations. This is a case wherein we experiment with and then discard some residue.

Every now and then I write about the advisability of making a home-grown reference book, using a regular spiral notebook. In it, copy a routine or listing that captivates your curiosity, and, in your own words, explain it for your personal benefit. Veteran CoConauts, as well as beginners, know that you can't memorize everything about the CoCo. Let your personal reference notebook supplement your manual.

We are progressing very slowly in our leisurely inspection of the CoCo 3 domain. Isn't it reassuring to discover how many programs we can salvage for use with vintage CoCos?

On a personal note, speaking of venerable CoCos, my Color Computer is one of the dark-age CoCos.

When my keyboard went, I bought a CoCo 3 rather than have my faithful CoCo repaired. It wasn't long before I yearned for my old friend. I high-tailed it to Radio Shack and had the keyboard replaced with another tile keyboard. I prefer the tile keys and I loved the old zero, which is now the CoCo 3 letter 'o', replacing the old square 'o'. My myopic orbs confuse the CoCo 3 zero with the number 8.

Do you know what I love best about "Old Faithful"? The broad expanse between side vents. (You newcomers can picture it by looking at the illustrations in the manual.) This area is my writing desk. I challenge you to write notes on your CoCo 2 or CoCo 3.

The other feature, whose demise I mourn, is the extra-wide ENTER key.

The other side of the coin is price. The cost of upgrading my 4K BASIC CoCo to 16K ECB and keyboard replacement, over time, has come to over $600. I got the CoCo 3, which is really a 32K ECB machine as far as we BASIC users are concerned, for a little over $200.

It is worth it! Now I have two friends instead of one. Maybe I'll name CoCo 3 "Son of CoCo."

My freely offered advice to owners of older CoCos is to consider investing in a CoCo 3, not to retire the old CoCo but to supplement it. There is something to say for operating two CoCos at the same time.

If you learned something from this tutorial, it is another bit of knowledge that you can add to your repertoire of CoCo skills. Above all, it should have been a stimulating, fun experience that you can't wait to repeat next month. ☐

**Listing 1:**

```
0 '<SPECKEYS>
1 WIDTH32
3 A$=INKEY$
4 IF A$="" GOTO3
5 X=ASC(A$)
10 IF X =189 GOTO100'BLACK CTRL
20 IF X=103 GOTO200'GREEN F1
30 IF X=4 GOTO300'YELLOW F2
40 IF X=64 GOTO400'BLUE ALT
100 CLS0:GOTO100
200 CLS1:GOTO200
300 CLS2:GOTO300
400 CLS3:GOTO400
```

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**Listing 2:**

```
0 '<S1>
1 WIDTH32
3 A$=INKEY$
4 IF A$="" GOTO3
5 X=ASC(A$)
10 IF X =189 GOTO100'BLACK CTRL
20 IF X=103 GOTO200'GREEN F1
30 IF X=4 GOTO300'YELLOW F2
40 IF X=64 GOTO400'BLUE ALT
50 IF X=95 GOTO500'RED <SHIFT UP
-ARROW>
60 IF X=91 GOTO600'BUFF <SHIFT D
OWN-ARROW>
70 IF X=21 GOTO700'CYAN <SHIFT L
EFT-ARROW>
80 IF X=93 GOTO800'MAGENTA <SHIF
T RIGHT-ARROW>
90 IF X=92 GOTO900'ORANGE <SHIFT
CLEAR>
100 CLS0:GOTO3
200 CLS1:GOTO3
300 CLS2:GOTO3
400 CLS3:GOTO3
500 CLS4:GOTO3
600 CLS5:GOTO3
700 CLS6:GOTO3
800 CLS7:GOTO3
900 CLS8:GOTO3
```

**Listing 3:**

```
0 '<S2>
1 WIDTH32
2 CLS:PRINT@231," PRESS <CTRL> K
EY"
3 A$=INKEY$
4 IF A$="" GOTO3
5 X=ASC(A$)
10 IF X =189 GOTO100'BLACK CTRL
20 IF X=103 GOTO200'GREEN F1
30 IF X=4 GOTO300'YELLOW F2
40 IF X=64 GOTO400'BLUE ALT
50 IF X=95 GOTO500'RED <SHIFT UP
-ARROW>
60 IF X=91 GOTO600'BUFF <SHIFT D
OWN-ARROW>
70 IF X=21 GOTO700'CYAN <SHIFT L
EFT-ARROW>
80 IF X=93 GOTO800'MAGENTA <SHIF
T RIGHT-ARROW>
90 IF X=92 GOTO900'ORANGE <SHIFT
 CLEAR>
100 CLS0:GOSUB2000
200 CLS1:GOSUB2000
300 CLS2:GOSUB2000
400 CLS3:GOSUB2000
500 CLS4:GOSUB2000
600 CLS5:GOSUB2000
700 CLS6:GOSUB2000
800 CLS7:GOSUB2000
900 CLS8:GOSUB2000:GOTO2
2000 FOR Z=1 TO 1000:NEXT:RETURN
```

**Listing 4:**

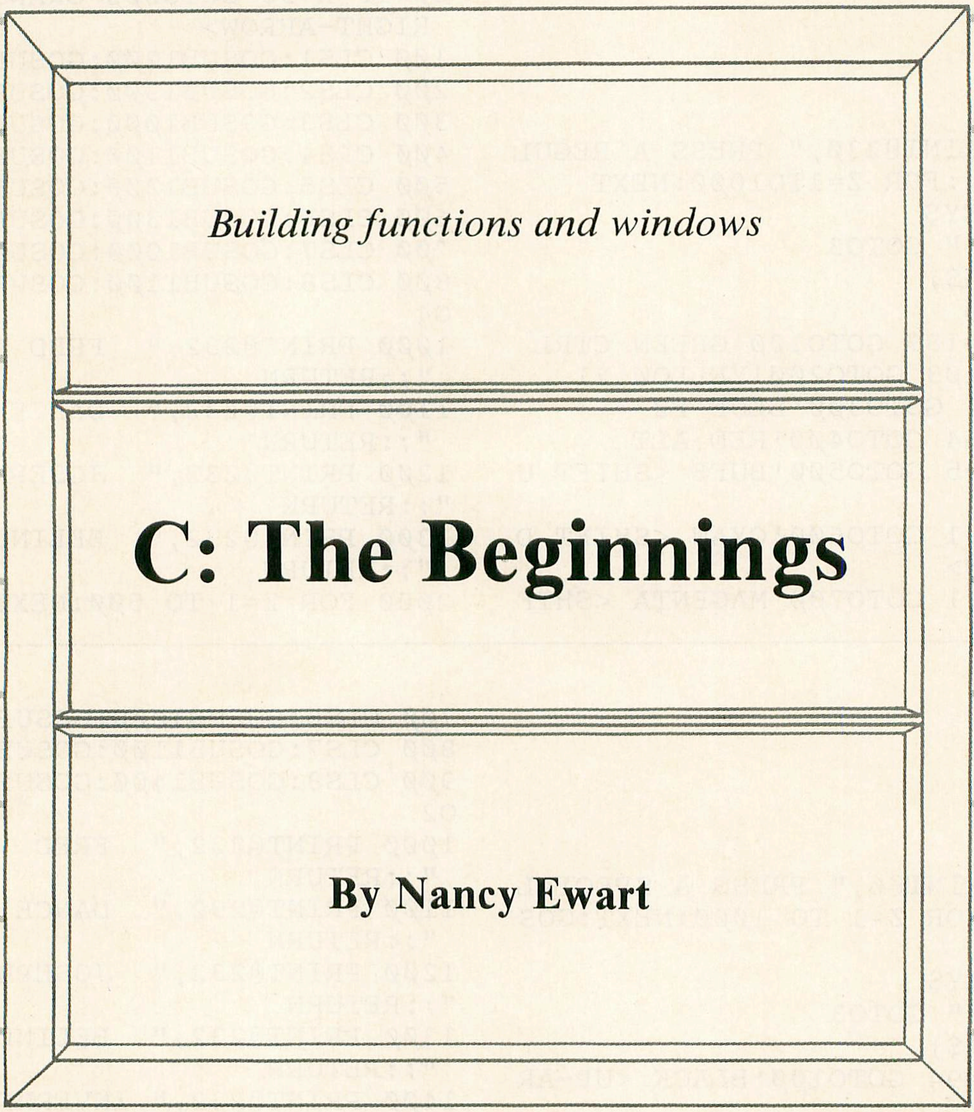
```
0 '<S3>
1 WIDTH40
2 CLS1: LOCATE10,10:PRINT" PRESS
 THE <CTRL> KEY";:LOCATE20,12
3 A$=INKEY$
4 IF A$="" GOTO3
5 X=ASC(A$)
10 IF X =189 GOTO100'GREEN CTRL
20 IF X=103 GOTO200'YELLOW F1
30 IF X=4 GOTO300'BLUE F2
40 IF X=64 GOTO400'RED ALT
50 IF X=95 GOTO500'BUFF <SHIFT U
P-ARROW>
60 IF X=91 GOTO600'CYAN <SHIFT D
OWN-ARROW>
70 IF X=21 GOTO700'MAGENTA <SHIF
T LEFT-ARROW>
80 IF X=93 GOTO800'ORANGE <SHIFT
 RIGHT-ARROW>
100 CLS1:GOSUB1200:GOSUB2000
200 CLS2:GOSUB1300:GOSUB2000
300 CLS3:GOSUB1000:GOSUB2000
400 CLS4:GOSUB1100:GOSUB2000
500 CLS5:GOSUB1200:GOSUB2000
600 CLS6:GOSUB1300:GOSUB2000
700 CLS7:GOSUB1000:GOSUB2000
800 CLS8:GOSUB1100:GOSUB2000:GOT
O2
1000 LOCATE13,10:ATTR3,2:PRINT"
 FRED  ASTAIRE ";:LOCATE22,12:RE
TURN
1100 LOCATE13,10:ATTR3,2:PRINT"
 DANCE  STUDIO ";:LOCATE22,12:RE
TURN
1200 LOCATE13,10:ATTR3,2:PRINT"
 JOSEPH  KOLAR ";:LOCATE22,12:RE
TURN
1300 LOCATE13,10:ATTR3,2:PRINT"
 BELINDA RAMSEY";:LOCATE22,12:RE
TURN
2000 FOR Z=1 TO 500:NEXT:RETURN
```

**Listing 5:**

```
0 '<S4>
1 WIDTH32
2 CLS0:PRINT@230," PRESS A REGUL
AR KEY ";:FOR Z=1TO1000:NEXT
3 A$=INKEY$
4 IF A$="" GOTO3
5 X=ASC(A$)
6 GOTO100
10 IF X =189 GOTO100'GREEN CTRL
20 IF X=103 GOTO200'YELLOW F1
30 IF X=4 GOTO300'BLUE F2
40 IF X=64 GOTO400'RED ALT
50 IF X=95 GOTO500'BUFF <SHIFT U
P-ARROW>
60 IF X=91 GOTO600'CYAN <SHIFT D
OWN-ARROW>
70 IF X=21 GOTO700'MAGENTA <SHIF
T LEFT-ARROW>
80 IF X=93 GOTO800'ORANGE <SHIFT
 RIGHT-ARROW>
100 CLS1:GOSUB1200:GOSUB2000
200 CLS2:GOSUB1300:GOSUB2000
300 CLS3:GOSUB1000:GOSUB2000
400 CLS4:GOSUB1100:GOSUB2000
500 CLS5:GOSUB1200:GOSUB2000
600 CLS6:GOSUB1300:GOSUB2000
700 CLS7:GOSUB1000:GOSUB2000
800 CLS8:GOSUB1100:GOSUB2000:GOT
O4
1000 PRINT@232,"  FRED  ASTAIRE
 ";:RETURN
1100 PRINT@232,"  DANCE  STUDIO
 ";:RETURN
1200 PRINT@232,"  JOSEPH  KOLAR
";:RETURN
1300 PRINT@232,"  BELINDA RAMSEY
 ";:RETURN
2000 FOR Z=1 TO 500:NEXT:RETURN
```

**Listing 6:**

```
0 '<S5>
2 CLS5:PRINT@6," PRESS A SPECIAL
 KEY ";:FOR Z=1 TO 1000:NEXT:GOS
UB3000
3 A$=INKEY$
4 IF A$="" GOTO3
5 X=ASC(A$)
10 IF X =94 GOTO100'BLACK <UP-AR
ROW>
20 IF X=10 GOTO200'GREEN <DOWN-A
RROW>
30 IF X=8 GOTO300'YELLOW <LEFT-A
RROW>
40 IF X=9 GOTO400'BLUE <RIGHT-AR
ROW>
50 IF X=95 GOTO500'RED <SHIFT UP
-ARROW>
60 IF X=91 GOTO600'BUFF <SHIFT D
OWN-ARROW>
70 IF X=21 GOTO700'CYAN <SHIFT L
EFT-ARROW>
80 IF X=93 GOTO800'MAGENTA <SHIF
T RIGHT-ARROW>
90 IF X=92 GOTO900'<SHIFT CLEAR>
100 CLS0:GOSUB1200:GOSUB2000
200 CLS1:GOSUB1300:GOSUB2000
300 CLS2:GOSUB1000:GOSUB2000
400 CLS3:GOSUB1100:GOSUB2000
500 CLS4:GOSUB1200:GOSUB2000
600 CLS5:GOSUB1300:GOSUB2000
700 CLS6:GOSUB1000:GOSUB2000
800 CLS7:GOSUB1100:GOSUB2000
900 CLS8:GOSUB1400:GOSUB2000:GOT
O2
1000 PRINT@232,"  FRED  ASTAIRE
 ";:RETURN
1100 PRINT@232,"  DANCE  STUDIO
 ";:RETURN
1200 PRINT@232,"  JOSEPH  KOLAR
";:RETURN
1300 PRINT@232,"  BELINDA RAMSEY
 ";:RETURN
1400 PRINT@232," INVERNESS,  FL.
 ";:GOSUB2000:RETURN
2000 FOR Z=1 TO 500:NEXT:RETURN
3000 PRINT@64,"  COCO WILL RUN T
HRU THE LO-RES CLS COLORS IN ROT
ATION FROM 0-8 STARTING WITH THE
 KEY YOU PRESS:"
3001 PRINTTAB(1)"0  BLACK","UP-A
RROW"," 1  GREEN","DOWN-ARROW","
 2  YELLOW","LEFT-ARROW"," 3  BL
UE","RIGHT-ARROW"," 4  RED","SHI
FT UP-ARROW"," 5  BUFF","SHIFT D
OWN-ARROW"
3002 PRINT@385,"6  CYAN","SHIFT
LEFT-ARROW":PRINT@417,"7  MAGENT
A","SHIFT RT-ARROW"," 8  ORANGE"
,"SHIFT CLEAR"
3003 GOSUB2000:RETURN
```



*Building functions and windows*

# C: The Beginnings

### By Nancy Ewart

**B**asically, I like C. I found it easy to learn once I got over the nearly insurmountable hurdles of the mechanics of typing the source code. It is exciting and interesting. Since C and OS-9 Level II are both used by other machines and the source code is portable, C is a choice with a future.

You can get started with C if you understand a few rules, such as how functions operate. You also need OS-9, a C Compiler and an editor that will permit curly braces, square brackets and back slashes.

The `main()` function starts all C programs (at least at my level of learning). Curly braces, {}, mark the beginning and end of the program itself. `/* */` set off comments; the C compiler will ignore anything within them. `Printf()` is the only other standard C function you need to get started. When you use it in a program, put what you want to print within quotes in parentheses, following with a semi-colon.

As is usual with computer languages, punctuation is very important. `Main()` does not use a semi-colon because what follows inside curly braces defines `main()`. Definitions get curly braces. `Printf()` gets a semi-colon because it acts as a statement, an instruction. If the source code is not correct, the C compiler will not work. For an in-depth look at how to "install" the C compiler on your system, see "Sailing Off to C" by Bill Barden (March 1987, Page 186).

Listing 1 shows how these functions are done. Add your address, telephone number and the year. Save the program using your initials and `.c` in the `SOURCES` directory of a C library disk.

Another advantage to C is that you can become creative in programming when you are just beginning to learn the language. When you learn early how to define functions specifically for a program you are creating, it seems like you are coining your own command vocabulary. No longer are you limited to a fixed vocabulary. If you want something done over and over again, you create a function to do it.

The program shown in Listing 2 is not a dramatically useful one. In fact, its output is trivial. The content and process of the program, however, show a novice how to begin designing and creating functions.

The program prints the sea chantey "Earlye in the Morning" and it illustrates the use of two C functions, `main()` and `printf()`, as well as how

---

*Nancy Ewart lives in Toms River, New Jersey, and is a partner in a framing/art supply/paperback book business. She has owned her CoCo for nearly two years and is a dedicated user.*

to create functions of your own. Save this program as `drunk.c`. After compiling, the command is `drunk`.

What do you think the printout of this source code will look like after it is compiled and the command `drunk` is in your current execution directory?

The next step is to add color. Listing 3 shows how to print a number as an integer, in its ASCII code or as a graphics character. Save this program as `trycolor.c`. After compiling, type `trycolor` on the main screen.

This usage is very versatile. Try substituting `N` for `140` and/or any number between 288 and 377. The next example in Listing 4 shows how to combine `printf("%c", x);` with function generation to burst forth in glorious technicolor.

A function like `stem()` is worth defining because it is used several times, but most words (and pictures) need a different approach. An answer at this time is to create building blocks of color. I defined the color number constants to lessen confusion. When you define a constant in this manner, use capital letters in the C tradition. The constant name can be any length. It should be long enough so you won't have to guess at its meaning two years from now.

The program in Listing 5 presents the word "gang" in blue and offset to the right.

The general convention in C is to put only one function on a line. In most cases this improves readability. However, it is easier to keep track of a sequence of graphics characters if you group them by screen line.

Lo-Res graphics must be run on the main screen, `TERM_VDG`, to get the full effect of the color. If you were to try this program in window three, you would get enough of a pattern to check accuracy, but no color.

Next, because there are several new commands in your commands directory, you can build an OS-9 file as follows:

```
welcome
echo
loreshi
gang
echo
echo Welcome to the OS-9 Sig
```

With just the information presented in this article you could design a C program to print labels for a club, team or scout group, make a picture with black as the background color, write and print a love poem for a greeting card, or compose a litany. In doing so, you play with these ideas to understand them better. It is really quite easy.

**Windows Were Made to C**

Using `config` with OS-9 Level II, choose `TERM_VDG` and `W`, `W1`, `W2` or `W3`. `TERM_VDG` lets you run `TsEdit` on the main screen. Using `iniz` and `shell`, set up `W1`, `W2`, and `W3`. I built several short programs to make this easier. See Listing 6.

Simply type `one` and press ENTER followed by CLEAR after you get the prompt back and you are in window one. Do the same for windows two and three. Put the OS-9 system disk with `TsEdit` and the C Compiler in Drive 0. Put the C Library disk in Drive 1. Copy `TsPars` onto `/d1/SOURCES`.

On the main screen type `chd /d1/SOURCES`. Then type `TsEDIT`. In window one type `chd /d1/SOURCES`. In window two type `free`. This helps you keep track of how much space is left on your system disk. In window three type `chd /d1/SOURCES`. Remember to press CLEAR to change windows. The CTRL is used to toggle upper- and lowercase and to duplicate commands.

Using `TsEdit`, type your source code. See Listing 7 for an example.

Save the program using `:w name.c`, but do not quit `TsEdit`. Instead, press CLEAR. In window one, run the C Compiler by typing `cc1 name.c`.

If the program compiles perfectly, go to window two and press CTRL and A to activate the `free` command. And then go to window three to run the program simply by typing `name`. Type `dir /d0/CMDS` to see your compiled program now in the commands directory.

If the source code produces errors in the compilation, go to window three and run a directory. Delete any files that were created by the compiler during the abortive effort. These files have names like `ctmp.3.i`. Then type `dir /d0/CMDS` to be absolutely sure the compiler did not get so far as to enter `name` in the system commands directory. If it did, delete it. Press CLEAR, and, eureka, you are back in `TsEdit`. Make and save your changes in the source code. Press CLEAR, then CTRL-A, and you are back compiling your program. No muss, no fuss, no bother.

After I successfully compile a program, I usually delete the compiled program from the system disk but keep the corrected source code in `Library/SOURCES`. This saves space on the system disk.

*(Questions or comments may be addressed to Nancy at 1789 Hooper Ave., Toms River, NJ 08753. Please enclose an SASE when requesting a reply.)* ☐

**Listing 1:**

```
main()  /* I call this ne.c */
{
  printf("\n"); /* Clear + slash makes the backslash */
               /* "backslash n" character constant.
                   Starts a new line. */
  printf("\n");
  printf("This program was created by\n");
  printf("your name.\n");
}
```

**Listing 2:**

```
main()
{  /* The functions used in this program are defined below. */

   sailor();sailor();sailor();
   early();
   longboat();longboat();longboat();
```

```
    early();
    weigh();weigh();weigh();
    early();
    scuppers();scuppers();scuppers();
    early();
    weigh();weigh();weigh();
    early();
    sailor();sailor();sailor();
    early();
}

early()
        /* Defines function "early", no "semicolon", use curly braces.  */
{
    printf("Earlye in the morning.\n");
    printf("\n");
}

sailor()
{
    printf("What shall we do with a drunken sailor,\n");
}

longboat()
{
    printf("Put him in a long boat til he's sober,\n");
}

weigh()
{
    printf("Weigh, heigh, and up she rises,\n");
}

scuppers()
{
    printf("Put him in the scuppers and wet him all over,\n");
}
```

**Listing 3:**

```
main()
{
    printf("%d %c\n", 140, 140);
}
```

**Listing 4:**

```
main()
{
    stem();
    stem();
    printf("%c%c%c%c%c%c%c%c%c\n",143,143,159,159,159,159,143,143,191);
    stem();
    stem();
}

stem()
{
    printf("%c%c%c%c%c%c%c%c%c\n",143,143,159,143,143,159,143,143,191);
}
```

**Listing 5:**

```
#define BLU 175
#define GRN 143

main()
```

```
{
 gf();gf();gt();go();bf();gt();bt();gt();bo();gt();bo();go();bf();period();
  gf();gf();gt();go();bo();gf();bo();gt();bo();go();bt();go();bo();go();bo();period();
  gf();gf();gt();go();bo();go();bt();go();bf();go();bo();go();bt();go();bo();go();bt();period();
  gf();gf();gt();go();bo();gt();bo();go();bo();gt();bo();go();bo();gt();bo();go();bo();gt();bo()
;period();
  gf();gf();gt();go();bf();go();bo();gt();bo();go();bo();gt();bo();go();bf();period();
}
bf() /* four blues */
{
  printf("%c%c%c%c",BLU,BLU,BLU,BLU);
}
bt() /* two blues */
{
  printf("%c%c",BLU,BLU);
}
bo() /* one blue */
{
  printf("%c",BLU);
}
gf() /* four greens */
{
  printf("%c%c%c%c",GRN,GRN,GRN,GRN);
}
gt() /* two greens */
{
  printf("%c%c",GRN,GRN);
}
go() /* one green */
{
  printf("%c",GRN);
}
period() /* green plus new line */
{
  printf("%c\n",GRN);
}
```

**Listing 6:**

```
          build one <enter>
         ?iniz w1<enter>
         ?shell i=/w1&<enter>
         ?
```

**Listing 7:**

```
main()

{
printf("Your Name\n");
printf("Street address\n");
printf("City, State, Zip\n");
}
```

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# The Upgrade Shuffle

### By Dan Downard
### Rainbow Technical Editor

*When I try to print text files with the* Filer *and* Ledger *programs, the first lines of every page print past the left margin. My printers work fine with all my other programs. Also, I want to upgrade my FD 501 single drive system for frequent use of OS-9 Level II, including C programming. I would like your advice on the following systems: a second SSDD 35-track drive; a DSDD 40-track drive mounted in Drive 1 (can you list technical requirements); and an 80-track DSDD Drive 2. What is the best solution for balanced use between BASIC and OS-9?*

*J. Pelletey*
*Chevy Chase, MD*

I don't have the combination of hardware you refer to, but it sounds like you have a software problem to me. If anyone else has experienced this problem, please write with the solution, and we'll print it. All of the more recent Tandy drives sold for the CoCo are 40-track — I doubt you can find any more 35-track drives even though the CoCo formats the disk at 35 tracks. If you are using Disk BASIC a `DSKINI`*x* will format at 35 tracks. Since OS-9 is RAM resident, drivers for external devices, such as disk drives, can be modified and loaded upon booting the system. OS-9 has drivers for 35-, 40- and 80-track drives and even hard drives.

Which is better — disk storage capacity or compatibility? Obviously, you cannot back up a 40-track drive to a 35-track drive! That is my only complaint with non 35-track disk systems. You can always beat the system by using the `COPY` command, or a disk utility in BASIC, or the `DSAVE` command in OS-9, so it's not as bad as it sounds.

I have two 35-track Radio Shack drives, plus an 80-track DS drive that I use on special occasions. To answer the rest of your question, a standard Radio Shack controller (Cat. No. 26-3022 or later) will work with all of the above floppy drives. You will also need a cable (Part No. 8709205) to connect the controller to your disk drive.

There are several superior third-party controllers on the market that use enhanced software to allow 40-track operation. Since Radio Shack has a copyright on Disk BASIC, any enhancement will not be 100 percent compatible. The best solution I am aware of is ADOS by Spectrosystems, a ROMable BASIC that is 99.9 percent Disk BASIC compatible, but still allows non 35-track drives.

### Disassembling BASIC

*I was wondering if there is a way to disassemble ECB commands through BASIC.*

*William Mikrut*
*Chicago, IL*

I have seen disassemblers written in BASIC, William, but I would not recommend them as they are relatively crude in nature. Why don't you consider *Disk EDTASM+*, or *EDTASM+*, from Radio Shack? The Z-BUG module has an excellent disassembler built in.

### Deskmate Dilemma

*I have a 64K ECB CoCo 2, FD-501 disk drive, DMP-105 printer, CCR-82 cassette recorder, and* Deskmate. *Is it possible to modify the printer module in* Deskmate *for 2400 baud without using OS-9? If so, how? Will OS-9 Level II run on the CoCo 2? I realize that the advanced CoCo 3 features would not be available to the CoCo 2. Finally, what would be the best method to mail text files made using a single-drive system and* Deskmate?

*James Dale Duncan*
*Zirconia, NC*

James, a letter appeared on Page 6 of the November 1986 RAINBOW which detailed a method of patching *Deskmate* for printing at 2400 baud. The only other way I know to change the printer baud rate in OS-9 is by way of the `XMODE` command. There have been some enhancements, such as `BAUD` and `TUNEPORT`, but they all function under OS-9. Yes, you need a CoCo 3 to use OS-9 Level II. As far as your *Deskmate* problem is concerned, just `COPY` the file to another disk. The person on the other end can do the same.

### 64K Solution

*I have a 1982 CoCo, modified to at least 32K by the addition of 64K chips. How can I check to see if it is usable as a 64K machine? Can these modifications be improved to run 64K programs?*

*Bob Carlson*
*Newport Beach, CA*

---

*Dan Downard is an electrical engineer and has been involved in electronics for 27 years through Ham radio (K4KWT). His interest in computers began about eight years ago, and he has built several 68XX systems.*

Due to the fact that you have an 'F', or 285 CoCo, I am sure that you have 64K chips installed. I would suggest trying to run any 64K program as the acid test. Memory checking programs are available, but seldom necessary.

### CoCo 3 BBS

*I will soon be purchasing the new CoCo 3 and I would like to put a BBS online. Do you have any suggestions on the type of software to buy? I have a 300/1200 baud modem, an RS-232 pack and a multipack interface. I would like to be able to upload and download using Xmodem, Ymodem and (CRC) Xmodem, and if possible, use the graphics. Please tell me what would be best for the features I want.*

*Tim Fultz*
*Moncks Corner, SC*

Tim, other than contacting someone with a BBS that you like and asking for help, we are at a loss. At one time there were approximately 10 different BBS ads in THE RAINBOW. Now the only thing I can recommend is *CoBBS* (by Richard Duncan, November 1985 to February 1986). It seems to be the standard of the CoCo world. Several improvements have appeared in later issues.

As far as I know, *CoBBS* does not have Xmodem drivers in the original article. If anyone has written one I'm sure we would be more than happy to publish it.

### Jumper Connections

*I enjoy my 16K ECB CoCo 2, but 64K would be nice, given the money. I read Tony DiStefano's article on the 2B in the September 1986 issue and got excited about doing my own upgrade to 64K. But the simplest way, just plugging in 4-by-64K chips, apparently requires connecting jumper J6, on the left of the RAMs. I looked. It's not there, at least not in my machine. I do have a jumper J7 on the right of the RAMs. Could that be it?*

*David B. Smith*
*Duluth, MN*

David, on most CoCos this jumper is labeled "64K," or J6. Don't mistake it for the ROM jumper, though. The ROM jumper is J1 through J5. This information came from the service manual for Cat. Nos. 26-3134B/3136B/3127B. Looking at the top, or component side, of your circuit board, this jumper should be on the lower left portion of the board.

### CoCo in a PC Case

*I have a 285 board CoCo modified and running in an IBM PC case. My system is configured as: two double-sided, double-density Qume drives, RS controller Version 1.1,* Word-Pak *(old), 64K printer buffer, NAP amber monitor, RS-232 pack, DMP-105, cassette and J&R Banker board. I want to use a hard drive and found a 5Mb Seagate model for $79. I know I'll need a hard disk interface and a controller. I plan to buy the Disto Super Controller with hard disk interface and/or Owl-Ware Winchester BASIC Interface and Software. I need to know if these systems are compatible with the Seagate hard drive and/or how do I configure the system to work? By the way, I'm running OS-9. I plan to upgrade to a CoCo 3 someday, and I want to keep my hardware.*

*Gerald J. Daniels*
*Cutoff, LA*

Gerald, I would recommend both of these suppliers when it comes to connecting your hard disk drive to your CoCo. Write them with the details and you'll be up in no time flat.

### Disk Crashes

*I have owned my CoCo 2 for about two years. Soon after I bought the CoCo, I got a disk drive. I paid $300 for the 26-3129 when it was on sale. For more than a year, I have had quite a few disks crashing on me. I have done everything I can think of. When typing in listings, I kill the old file when updating my work. I have my disks away from magnetic sources. I'm pretty sure it isn't static electricity. I have tried many things, but none seem to stop this bizarre occurrence.*

*Jesse Sanders*
*Chimney Rock, CO*

The problem might be that you are trying to save your programs using the high-speed poke, Jesse. Another thing to check is the connection between the disk controller and the drives. It can become corroded and cause erratic operation. The same goes for the disk controller connection to the CoCo.

The easiest way to clean these contacts is with a soft rubber pencil eraser. Just wipe the contact surfaces with an eraser and see if this helps. This is the reason so many people prefer gold contacts for connections of this sort. Gold doesn't corrode like tin.

**Your technical questions are welcomed. Please address them to: Downloads, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We reserve the right to publish only questions of general interest and to edit for space and clarity. Due to the large volume of mail we receive, we are unable to answer letters individually.**

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## Barden's Buffer

# The Mystery of the Novice Bell Ringer

## *or* Elementary Recursion, Watson

### By William Barden, Jr.
### Rainbow Contributing Editor

"Watson, I'm afraid that I must go," said Holmes, as we sat down together for breakfast one morning.

"Go? Where?"

"To Oxford, Saint Andrew's Monastery. Perhaps this letter will explain."

He handed me a short missive, printed on line printer paper by a dot matrix printer. It read:

*My Dear Mr. Sherlock Holmes:*

*I am writing you as I have nowhere else to turn. I am the abbot at Saint Andrews in Oxford. Shortly after noon yesterday, the noon bells were curtailed. The body of the bell ringer, a Henry Saxon, was found at the base of the bell tower. In the bell-ringing room of the tower, a Radio Shack Color Computer 3 was found with a strange screen display. It is enclosed for your perusal.*

*The local constabulary is sorely baffled by the circumstances surrounding the tragedy and suspects foul play. I cannot allow a great deal of publicity at this time, as it coincides with the annual Saint Andrews Charity Drive. Can you help us solve this unfortunate situation?*

*With optimistic hopes,*
*Brother John*

"The abbot had presence of mind enough to dump the screen, Watson. This is what was on it." Holmes held a piece of paper up to the light. On first perusal, I discerned the following from a list of nonsense words:

```
cbeafd
cbeadf
cbedaf
cbedfa
cbefda
cbefad
cbfdae
```

"It appears to be some sort of code, Holmes."

"I think not, Watson. In any event, if you would accompany me, you might find additional material for those stories you are always compiling about my exploits."

And so it happened that I found myself in a first-class carriage flying toward Oxford. Sherlock Holmes, his eager face framed by his Deerstalker traveling cap, his fingers racing over the keyboard, was busily engaged in his Model 100 computer.

"We are traveling well," he said, checking the computer's display screen. "Our present rate is 85 and one-quarter miles per hour."

"I have not observed mile markers," I said.

"Nor have I. It's a simple calculation when you have a transducer connected to the wheels. Tell me, what do you make of the contents of the Color Computer screen?"

"As I said before, it's obviously some sort of code," I replied, somewhat annoyed in Holmes overlooking the obvious. "Perhaps you could solve it on your Model 100."

"Watson, you never cease to amaze me. Didn't you have algebra in the course of your medical studies? The display is not a code, it is a *permutation.*"

"A permutation?"

"Yes. Suppose that you have the letters a, b, c, d, e and f. In how many different ways can you arrange them?"

"Well, I suppose . . . that is — "

"Try a simpler case, the letters a, b and c."

"Well, in that case, you would have abc, acb, bac, bca, cab and cba — six different ways!"

"Precisely, Watson. As a matter of fact, for any given number of letters, you would have exactly the number of the letters' *factorial.*"

"Factorial?"

"Yes. The factorial of 1 is 1; the factorial of 2 is 1 times 2, or 2; the factorial of 3 is 1 times 2 times 3, or 6; and so forth."

"Ah, I see, Holmes. In that case, the number of different ways you could arrange the letters a, b, c, d, e and f would be 1 times 2 times 3 times 4 times 5 times 6, as there are six letters. If I am correct, that would be 720 different combinations. And that is what was on the display of the Color Computer 3!"

"Bravo, Watson!"

---

*Bill Barden has written 27 books and over 100 magazine articles on various computer topics. His 20 years' experience in the industry covers a wide background: programming, systems analysis and managing projects or computers ranging from mainframes to micros.*

"But what was a bell ringer doing with a display of the permutations of six letters?"

"The question, Watson, is not what he was doing with them, but whether they have any bearing on this case at all!"

We arrived at the station and left the train, catching a carriage to Oxford. We were met at Saint Andrews by Brother John, a large, red-faced monk whose eyes twinkled merrily.

"Ah, Mr. Holmes. Thank you so much for coming."

"My pleasure, Brother John. I see that you, too, are a computer addict."

"Why, Mr. Holmes, how did you know?" he queried, surprised and puzzled.

"The bottoms of your sandals are beveled on the outer edges, a common indicator of those who do much sitting with their legs crossed. Furthermore, the fronts of your sleeves are somewhat frayed, as if they continually brush against equipment of some type. The calluses on your fingers indicate that you use a keyboard of the Color Computer type, one not quite as wide as an IBM Compatible. I've written a short monograph on this subject and am familiar with the callus patterns produced by various types of keyboards. Lastly, you have a subscription renewal card from THE RAINBOW just visible in your left robe pocket."

"Well, Mr. Holmes, I suppose it is obvious enough when you consider those facts."

"Quite. May we see the scene of the accident?"

"Of course. This way, gentlemen."

We walked toward the immense church of Saint Andrews. Its belfry was very high up — perhaps 70 feet. From our point of view on the pathway, we could just make out six bells of various sizes within the confines of the open top of the tower.

"This is where the body was found, Mr. Holmes," said the abbot, pointing to a spot about 10 feet from the base of the tower.

Holmes got down on his hands and knees and examined the area. Peering through a magnifying lens, he found a small piece of paper and quickly put it in a plastic bag. After a moment's further study, he sprang to his feet.

"All finished here, Brother John. May we see the bell-ringing room?"

Brother John took a large ring of keys from the confines of his robe and unlocked the oak door to the bell tower. He led us into a small room containing several tables and chairs. Six bell ropes dangled from holes in the ceiling. On one of the tables sat a Color Computer 3, its display blank.

"I see the police have been here," said Holmes.

"Yes, an Inspector Lestrade. He turned off the computer."

"A pity. He may have destroyed invaluable evidence. Nevertheless, we shall see. . . ."

Holmes took out a 5¼-inch disk from an envelope, inserted it into Drive 0, and typed in a few commands.

"Tell me, Brother John. How long had Henry Saxon been ringing bells at Saint Andrews?"

"Only for a week. The poor lad had been our choice over several other boys and a young lady who wanted the job."

"Do you have the names and addresses of these other young applicants?"

"I'll write them down for you, sir," said the abbot.

On the way to the hotel, Holmes turned to me and said, "Watson, I'm afraid I must go back to London for a brief time. In the meantime, dear fellow, I must ask you a favor."

"Of course. What is it?"

"There's a short one-evening seminar on recursion at Oxford that I've arranged for you to attend. Would you be so kind?"

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"If I must, Holmes, but I don't see how this will help," I protested.

"Believe me, it's all pertinent, Watson. I'll be back the day after tomorrow."

That evening, armed with a small notebook and a few pencils, and feeling like a medical student again, I arrived for the seminar. I had heard the term *recursion* before in reference to computing, but was not really certain what was involved. The lecturer mounted the podium and began to speak.

"Good evening, ladies and gentleman. This lecture will cover the subject of computing recursion. First of all, what exactly is recursion? To answer that, let me illustrate with an anecdote. If I have told this anecdote twice before, however, please stop me! When I was younger, I attended a lecture at Oxford. It began:

"Good evening, ladies and gentleman. This lecture will cover the subject of computing recursion. First of all, what exactly is recursion? To answer that, let me illustrate with an anecdote. If I have told this anecdote twice before, however, please stop me! When I was younger, I attended a lecture at Oxford. It began:

"Good evening, ladies and gentleman. This lecture will cover the subject of computing recursion. First of all, what exactly is recursion? To answer that, let me illustrate with an anecdote. If I have told this anecdote twice before, however, please stop me! When I was younger, I attended a lecture at Oxford. It began — "

A voice shouted, "You've told this story twice before!"

"and ended two hours later.

"and ended two hours later.

"and ended two hours later.

"You see, the first paragraph of the talk was *recursive*. It was self-referential and 'called' itself two more times. It could have called itself an infinite number of times, but we added a control that terminated it when someone indicated that I had told the story twice before. That, in a nutshell, is recursion."

I sat enraptured, listening intently. The concept seemed simple enough, but what did it have to do with the bell ringer's death?

"Let's take another simple example. Suppose that we want to find the factorial of a number . . ."

The lecturer gave a brief explanation of factorials, similar to the one Holmes had provided on the train.

"A simple program in BASIC to do it is:

```
100 INPUT I
110 T = 1
120 FOR J=1 TO I
130 T = T * J
140 NEXT J
150 PRINT "The factorial of"; I; "is"; T
```

"However, another way to get the same answer is to use recursion:

```
Procedure Factorial
  param 1, n: integer
  if i <> 1 then
    n = n * i
    run factorial( i - 1, n )
  endif
end
```

"This particular program happens to be in BASIC09, the Color Computer BASIC used under OS-9. BASIC09 allows for recursion, as do PASCAL, C, and other newer languages. A PASCAL or C version of the program would be very similar.

"Let's take a good look at what is happening here. In case you're not familiar with BASIC09 statements, the `IF` and `ENDIF` are easy enough. They just define a block of code that is run if a condition is met. The `END`, of course, marks the end of the procedure. The procedure itself is just a block of code with a name, in this case 'Factorial'.

"The `PARAM` statement, though, is more complicated. It defines what *parameters* are to be sent to the procedure by a calling program. In this case, two parameters are to be sent, `I` and `N`. Because BASIC09 is strongly typed, it likes to see variables defined as integers or other data types. `I` and `N` here are both integers rather than floating-point numbers. The parameters are used in the course of the program. Here, `N` holds the factorial result on exit, and `I` is the number for which the factorial is to be found.

"The most interesting statement in the code is the `RUN` statement. It calls another procedure. In this case, though, the procedure called is factorial itself! Factorial is called with two input arguments, `I-1` and `N`.

"Suppose that we call factorial with this code:

```
N := 0
RUN Factorial( 3, N )
PRINT "The factorial of 3 is "; N
```

"Factorial will be executed and a check made for `I <> 1`. `I` is initially `3`, so the code in the `IF` structure will be executed, setting `N` equal to `N*I = 3*I = 3`. The `RUN` statement will then be executed, calling factorial again, with `I-1`, `N` or `2, 3`.

"When factorial is reentered, the new `I` will be `2` and `N` will be `3`. The `IF` block will again be executed, setting `N` to `3*2` or `6`. The `RUN` will again call factorial, this time with `I-1`, `N` or `1, 6`. When factorial is entered for the third time, `I` will equal `1` and the code in the `IF` block will not be executed. Instead, the `END` statement will cause a return to the calling program. The calling program here, though, is the second factorial program. A return will therefore be made back to the statements after the `RUN`, the `ENDIF` and `END`. The `END` here will cause a return to the first factorial at the `ENDIF`, `END` point. A return here will return back to the system with `N` set equal to `6`, the factorial of `3`."

"I have a question, sir," I called.

"Yes, er, Doctor Watson," the lecturer said, noting my seminar name tag. "By the way, surely, you are not the famous biographer of Mr. Sherlock Holmes?"

"Yes, I confess I am. My question, however, is this: Why does variable `I` change — wouldn't it always be equal to the initial value of `3`? Wouldn't every call to factorial result in an argument of `I-1` or `2`?"

"No, Doctor Watson, for a very good reason. When a `RUN` call is made, constants or expressions such as `I-1` are passed by *value*. Any changes made by the called program can change the value but they are not passed back. However, if the parameter is a variable, array, or data structure, they are passed to the called program by *reference*. The variable can then be changed in the called program. That's why `N` was kept as a running subtotal for the factorial while `I-1` was used to pass smaller and smaller values of `I`."

"Quite so. Yes, it makes sense. Thank you."

The remainder of the evening was spent discussing more topics in recursion. It appeared that recursion could produce some very simple code by the process of having procedures call themselves. However, recursion had a dark side — it uses a lot of memory for storing copies of return addresses and data passed by value.

At the end of the lecture I knew much more about recursion than I had known before. I was reminded of the little girl in the United States colonies who wrote to a newspaper editor, remarking that an article she had read told her "much more about penguins than she really wanted to know!" In spite of the recursion lecture, I still did not know how the subject of recursion was related to the bell ringer's death.

The following day I arose early. I was to meet Holmes at Brother John's study at 3 o'clock. I thought perhaps a visit to the local Radio Shack would be a convenient and interesting way to pass the time. I walked the short distance and entered the store.

"Hello, sir. May I help you?" asked a clerk.

"I'm just looking, my good man," I replied.

While examining some new MS-DOS products, I noticed a strange-looking man puttering about the Color Computer display. He was a slight, sickly person, with a collection of mechanical pencils in one pocket. He was peering intently at one of the store clerks through a pair of broken eyeglasses patched with a Band-Aid.

A shoplifter, I thought, or a computer nerd. It was extremely difficult to tell. I was about to mention him to the store manager, when the fellow came shuffling over.

Suddenly, the features of his face relaxed for an instant, and I could tell that it was my friend Holmes. I uttered an

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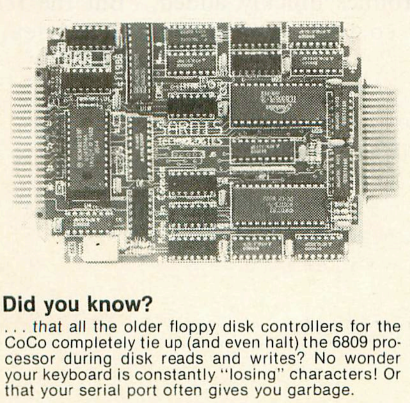

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involuntary gasp. One of these days he would pull that act once too often.

"I'll see you at 3 o'clock, Watson," he whispered.

At 3 o'clock I arrived at Brother John's study. Brother John, Holmes and Inspector Lestrade were also there. Lestrade held a temporary assignment at Oxford and had been the examining officer in this case.

"What's this about, then, Mr. Holmes?" demanded Lestrade. "We have made a thorough investigation of the accident and concluded that there was no foul play."

"On the contrary, Inspector, there was indeed foul play. Henry Saxon, the apprentice bell ringer, was murdered!" cried Holmes.

"Come, come, Mr. Holmes. Who would murder an apprentice bell ringer?"

"There was intense competition for the bell-ringing position. After all, Saint Andrews is one of the largest churches in this section of the country and still rings its bells by hand. Four people had applied for the position. Of the four, only Henry Saxon had the skills necessary to play the bells."

"What skills are there in playing bells, Mr. Holmes?" scoffed Lestrade.

"More than you realize, Inspector. The church at Saint Andrews has six bells of different tones. It has long been a test of skill to see how many different sequences of bells could be played. With three bells, labeled a, b and c, there are six such sequences: abc, acb, bac, bca, cab and cba. With six bells, there are 720 such sequences.

"Young Saxon used his Color Computer 3 to compile a list of all possible sequences. This was the list still present on the display screen of the Color Computer while you were making your examination and which Brother John here had the presence of mind to hard copy before your blundering destroyed it!" Holmes thundered. He puffed thoughtfully on his pipe a few moments.

"Saxon's program was a marvel in brevity. It was one of the things that helped him play the bells so well. The murderer was also a computer buff in addition to being one of the other three candidates for the position. The murderer interrupted the unfortunate bell ringer, made him climb the bell tower to inspect an Archer intercom system, and pushed him to his death. I found this where the body was found."

*Two-Liner Contest Winner . . .*

No special instructions for this one. Unless you want to use it to obtain useful information from your "friends."

**The listing:**

```
10 PMODE4,1:PCLS0:SCREEN1,1:PMOD
E3:DRAW"C2BM0,170R255C0BM0,48R36
D2R2DR4DR8UR4UR2U2R58D2R2D10R3DR
8UR3U24LU2L2UL66UL2U2LU3R2U4L6U4
R24UR2U2RU2LUL65DLD2RD2R2DR24D4L
6D4R2D3LD2L2DL34":PAINT(5,180),2
,2:PAINT(5,43),3,0:D$="D3RD2RDLD
L2DUL2ULURU2RU3"
20 FORX=64TO160STEP8:X$=STR$(X):
DRAW"C2BM127,"+X$+D$+"C1BM127,"+
X$+D$:NEXT:SOUND200,1:FORX=4TO94
STEP9:CIRCLE(127,170),X,1,.5,.01
,.5:NEXT:FORX=4TO94STEP9:CIRCLE(
127,170),X,2,.5,.01,.5:NEXT:GOTO
20:'faucet BY jim stewart
```

*James Stewart*
*Highland Falls, NY*

(For this winning two-liner contest entry, the author has been sent copies of both *The Second Rainbow Book of Simulations* and its companion *The Second Rainbow Simulations Tape*.)

Holmes held up a small piece of paper with the letters *dio* still visible.

"Just before he fell, we can surmise the bell ringer grabbed at the coat of his assailant, succeeding only in tearing off a portion of a blank sales receipt from an Archer sales receipt booklet. The letters *dio* fit the type style used for Radio Shack paperwork in this area. I have done a short monograph on electronic retail store type styles."

"That explains why you were in the Radio Shack store earlier, Holmes," I said.

"Yes, Watson, I was checking the suspected murderer's programs, which he kept on the store's computer. You nearly upset the apple cart by getting me arrested as a shoplifter or computer nerd."

"Holmes, I had no idea — "

"So, it's a simple enough case, then," said Lestrade. "The murderer did in the victim out of jealousy over not getting the bloomin' position."

"Not quite, Inspector. The final insult was the program that Mr. Saxon had used. It was so much more elegant than the murderer's that he was incensed. Saxon used recursion while the murderer blundered through without it."

"Recursion?" Lestrade appeared puzzled.

"Quite simple, really," I said. "It's a technique that reminds me of a story. The story goes like this. . . ."

"I'm sorry, Watson, but we must get to Radio Shack before it closes," Holmes interjected.

The four of us hailed a cab and rode to the store. We entered and found our murderer at the front of the store, watching music videos on eight televisions.

"All right, Mr. White. The game is up!" shouted Holmes. The murderer, realizing that his crime had been discovered, jumped over a stack of Archer proximity-actuated Robot Transformers to make an escape. All 32 robots powered on and rolled toward him, and he stumbled over the first one. Lestrade quickly reached him, handcuffed him and led him out.

On the way back to London, Holmes was jubilant, recounting the details of the mystery.

"But Holmes, there's one thing that puzzles me. Why did you want me to take the seminar on recursion?"

"Well, Watson, you must admit that it did not hurt your knowledge of computing. Also, it kept you from underfoot while I was researching the crime." I must have appeared somewhat hurt, for Holmes quickly added, "But the real reason, Watson, was so that your readers could learn something as well!"

```
Procedure Permutation
  param n : integer; a$ : string$[ 10 ]
  for i = 1 to len( a$ ) - n + 1
      a$ = left$( a$, n - 1 ) + right$( a$, len( a$ ) - n )
          + mid$( A$, n, 1 )
    run Permutation ( n + 1, a$ )
  next i
  if n = len( a$ ) then print a$
  endif
end
```

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---

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## KISSable OS-9

# The Evolution Continues

### By Dale L. Puckett
### Rainbow Contributing Editor

*KISSDraw* continues to grow! This month we show you how to add a mouse-driven menu to your drawing program. But more importantly, we define a new data type that will make it easier to pass data between the growing number of procedures in *KISSDraw.*

If you are getting into C programming with OS-9 Level II on the Color Computer 3, you are in for a treat. The new `/dd` (default device) descriptor can really speed you along. For example, we have our hard disk set up as `/dd`. To make it work with C, we moved the `DEFS` and `LIB` directories to the hard disk and then patched the hardcoded `/d1/DEFS` and `/d1/LIB` references in `CC1` and `C.PREP`. In `CC1` you'll find them around $0EE4. In `C.PREP`, the offset is at $135B. Change the references so they read `/dd/DEFS` and `/dd/LIB`. In Hex, you will be changing a $4431 to $4444. After you make this change you will be amazed at your CoCo's performance — especially if you have made sure your current data directory is on the hard drive also.

We went one step further here and put our current data directory and our source file on the Disto 512K RAM disk. This lets the C compiler write all of its temporary files much faster than the five and a half minutes it used to take when everything was on floppies.

BASIC09, OS-9 and the mouse that plugs in the back of your Color Computer can give you a whole new programming perspective, and that's where we're headed this month. The flow of a program used to be dictated by the machine. The flow of today's programs, however, is dictated by the person using the program. When the user clicks the mouse button an event is generated. The flow of the program from that point on depends on the type of event that has occurred. A short piece of C code like this makes up the main event loop of almost every Macintosh application. *KISSDraw4* works the same way on the CoCo. But this technique does not have to be limited to drawing programs. It can be used in every program you write. It's a whole new way to look at the world.

In English you could define the skeleton program like this:

```
Repeat
    Get an Event from the Event
    Queue
    Determine what type of event it is
    Respond to the event if appropriate
Until application is terminated.
```

Take a close look at the main event loop of the procedure *KISSDraw4*. You'll see it in English in Figure 1.

**Figure 1:**

```
LOOP Forever

Escape from the loop when any character is typed

But in the meantime,
    Has there been an event?
    Was the event in the KISSDraw toolbox?
        If so, which tool does he want?
        Make pencil cursor to tell him he has tool
        Let him use tool in window
        Make arrow cursor again when he is done with tool
    Was the event in the KISSDraw Menu Bar at the top of screen?
        If so, go handle menu request
ENDLOOP (* Go back and keep waiting for another event
```

---

*Dale L. Puckett, who is author of* The Official BASIC09 Tour Guide *and co-author, with Peter Dibble, of* The Complete Rainbow Guide to OS-9, *is a free-lance writer and programmer. He serves as director-at-large of the OS-9 Users Group and is a member of the Computer Press Association. Dale is a U.S. Coast Guard lieutenant and lives in Rockville, Maryland.*

## Listing 1: `test`

```
 PROCEDURE test
(* procedure to test user defined record types
TYPE date=month,day,year:INTEGER
TYPE address=city,state:STRING[20]; zip:INTEGER
TYPE totals=paid,received,balance:REAL

TYPE RealSkinny=time:date; place:address; amount:totals

DIM TheWorks:RealSkinny

TheWorks.time.month:=12
TheWorks.amount.paid:=199.98

PRINT TheWorks.time.month
PRINT TheWorks.amount.paid
```

## Listing 2: `KISSDraw4`

```
PROCEDURE KISSDraw4
 0000      (* Drawing program that lets you select a tool by clicking
 003A      (* on an ICON
 0047
 0048      TYPE rodent=Vld,Act,ToTm:BYTE; X1:INTEGER; TTTo:BYTE; TSSt:

            INTEGER; CBSA,CBSB,CCtA,CCtB,TTSA,TTSB,TLSA,TLSB:BYTE

            ; X2,BDX,BDY:INTEGER; Stat,Res:BYTE; AcX,AcY,WRX,WRY:

            INTEGER
 00B9
 00BA      TYPE stats=event,InWindow,InToolBox,InMenuBar,line,box,circle

            ,ellipse,bar,arc,fill,text,freehand,patterns,horzlines

            ,vertlines,slantright,slantleft,dots:BOOLEAN
 010D
 010E      TYPE cursor=NoCur,arrow,pencil,cross,hourglass,NoIcon,TextBar

            ,Scross,Icon,IconBuff:BYTE
 013D
 013E      TYPE packet=mouse:rodent; status:stats; pointer:cursor
 015B
 015C      DIM ButtonEvent:packet
 0165      DIM LastClicks:BYTE
 016C      DIM char:STRING[1]
 0178
 0179      char:=""
 0180      LastClicks:=0
 0187      ButtonEvent.status.event:=FALSE
 0194      ButtonEvent.status.line:=FALSE
 01A1      ButtonEvent.status.box:=FALSE
 01AE      ButtonEvent.status.circle:=FALSE
 01BB      ButtonEvent.status.ellipse:=FALSE
 01C8      ButtonEvent.status.bar:=FALSE
 01D5      ButtonEvent.status.arc:=FALSE
 01E2      ButtonEvent.status.fill:=FALSE
 01EF      ButtonEvent.status.text:=FALSE
 01FC      ButtonEvent.status.freehand:=FALSE
 0209
 020A      ButtonEvent.pointer.NoCur=0
 0218      ButtonEvent.pointer.arrow=1
 0226      ButtonEvent.pointer.pencil=2
 0234      ButtonEvent.pointer.cross=3
 0242      ButtonEvent.pointer.hourglass=4
 0250      ButtonEvent.pointer.NoIcon=5
 025E      ButtonEvent.pointer.TextBar=6
 026C      ButtonEvent.pointer.Scross=7
 027A      ButtonEvent.pointer.IconBuff=202
 0288
 0289      (* First we need to start with a clear screen
 02B6      (* and draw the menu
 02CA
 02CB      RUN gfx2("clear")
 02D8      RUN KISSdMenu
 02DC
 02DD      (* We must bring the high resolution mouse on line
 030F      (* and find out where it is pointing
 0333
 0334      RUN setupmouse
 0338      RUN gfx2("gcset",ButtonEvent.pointer.IconBuff,ButtonEvent.pointer.arrow

            )
 035B
 035C      LOOP  \REM Main Event Loop
 0370
 0371      EXITIF char<>"" THEN
 037D      ENDEXIT
 0381
 0382        RUN inkey(char)
 038C        RUN getKISSmouse(ButtonEvent)
 0396
 0397        (* Has there been an event
 03B2        (* Is Button Down
```

Because BASIC09 lets us define our own data types, we were able to define a large data packet named `ButtonEvent` that we use to pass information between all the procedures that make up *KISSDraw4*. After we defined the data type in the main program, we copied it into the other procedures using *DynaStar*, our screen editor.

> ***"The real value in this month's listings comes from comparing them to last month's."***

Since the program is still evolving, we'll probably change our data type definition several times before we complete the project. The names of the fields in our data type make it possible to read our program as if it were written in English. Rather than writing:

```
run gfx2("gcset",202,2)
```

which means absolutely nothing, you can write:

```
run gfx2("gcset",ButtonEvent.
pointer.IconBuff,ButtonEvent.
pointer.Pencil)
```

Which form do you think you will be able to understand six months from now?

To ease into the simplicity of defining BASIC09 data types, study the listing `test`. In `test`, we defined three separate data types named `date`, `address` and `totals`. We then combined the three into a fourth data type named `RealSkinny`.

After you define a data type, you must always reserve memory for the data with the `DIM` statement. In `test`, we named our variable `TheWorks`. Notice its type is `RealSkinny`. In order to prove that it was working, we initialized several fields in the data record and printed the results.

We needed to combine data types because of the number of fields we wanted to pass between procedures in *KISSDraw*. We wound up defining three data types — `rodent`, `stats` and `cursor` — first. The data type `rodent` holds the standard packet of information about the mouse that is returned by `syscall`. We used the data type `stats` to carry the stats of a number of boolean variables and the data type `cursor` to carry the value of the various graphics cursors available in OS-9. Eventually, we will most likely change the various fill patterns fields so they can carry the value of the number that represents them in `gfx2` command lines.

We'll also most likely add a few new fields that we didn't realize we needed at first.

We are developing *KISSDraw4* in a module fashion. The shorter a procedure, the better the chance that we can make it work properly. Once we know a procedure works, we can let other procedures call it. Last month we just got the program working. This month we concentrate on the structure. We want it to be easy to read and understand. We also want to be able to add new functions in separate modules in a manner that doesn't require us to change previously developed procedures.

The real value in this month's listings comes from comparing them to last month's. We hope you notice a marked improvement. This month we only reprinted one of the individual drawing procedures, `KISSDrawBox`. Notice how we pass all of the information needed by the program in one variable named `ButtonEvent`. BASIC09's data typing makes this possible. Once we passed `ButtonEvent` to a procedure, we were able to address any individual field within the record when we needed to.

*KISSDraw4* is the main program and it calls all the other procedures needed.

```
 03C3
 03C4          IF ButtonEvent.status.event THEN
 03D3            IF ButtonEvent.status.InToolBox THEN
 03E2              RUN WhichTool(ButtonEvent)
 03EC              RUN gfx2("gcset",ButtonEvent.pointer.IconBuff,ButtonEvent.pointer.pencil

                    )
 040F              RUN DoEvent(ButtonEvent)
 0419              RUN gfx2("gcset",ButtonEvent.pointer.IconBuff,ButtonEvent.pointer.arrow

                    )
 043C            ENDIF
 043E
 043F            IF ButtonEvent.status.InMenuBar THEN
 044E              RUN HandleMenu(ButtonEvent)
 0458            ENDIF
 045A          ENDIF
 045C        ENDLOOP
 0460
 0461        (* Turn Graphics Cursor off before leaving program
 0493        RUN gfx2("gcset",ButtonEvent.pointer.NoCur,ButtonEvent.pointer.NoCur

              )
 04B6        END
 04B8
```

### Listing 3: GetKISSMouse

```
PROCEDURE GetKISSMouse
 0000        (* Reads the present location of the mouse and
 002E        (* returns the status of the button.
 0052
 0053        TYPE rodent=Vld,Act,ToTm:BYTE; X1:INTEGER; TTTo:BYTE; TSSt:

              INTEGER; CBSA,CBSB,CCtA,CCtB,TTSA,TTSB,TLSA,TLSB:BYTE

              ; X2,BDX,BDY:INTEGER; Stat,Res:BYTE; AcX,AcY,WRX,WRY:

              INTEGER
 00C4
 00C5        TYPE stats=event,InWindow,InToolBox,InMenuBar,line,box,circle

              ,ellipse,bar,arc,fill,text,freehand,patterns,horzlines

              ,vertlines,slantright,slantleft,dots:BOOLEAN
 0118
 0119        TYPE cursor=NoCur,arrow,pencil,cross,hourglass,NoIcon,TextBar

              ,Scross,Icon,IconBuff:BYTE
 0148
 0149        TYPE packet=mouse:rodent; status:stats; pointer:cursor
 0166
 0167        TYPE registers=cc,a,b,dp:BYTE; x,y,u:INTEGER
 018C
 018D        DIM RegisterSet:registers
 0196        DIM callcode:BYTE
 019D        PARAM ButtonEvent:packet
 01A6
 01A7        RegisterSet.a:=0
 01B2        RegisterSet.b:=$89
 01BE        RegisterSet.x:=ADDR(ButtonEvent.mouse)
 01CF        RegisterSet.y:=1
 01DA        callcode:=$8D
 01E2
 01E3        RUN syscall(callcode,RegisterSet)
 01F2
 01F3        IF ButtonEvent.mouse.CBSA<>0 THEN
 0205          ButtonEvent.status.event:=TRUE
 0212        ELSE
 0216          ButtonEvent.status.event:=FALSE
```

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```
0223        ENDIF
0225
0226        IF ButtonEvent.mouse.AcY<10 THEN
0238          ButtonEvent.status.InMenuBar:=TRUE
0245        ELSE
0249          ButtonEvent.status.InMenuBar:=FALSE
0256        ENDIF
0258
0259        IF ButtonEvent.mouse.AcX<40 THEN
026B          ButtonEvent.status.InToolBox:=TRUE
0278        ELSE
027C          ButtonEvent.status.InToolBox:=FALSE
0289        ENDIF
028B
028C        IF NOT(ButtonEvent.status.InMenuBar) AND NOT(ButtonEvent.status.InToolBox

             ) THEN
02A7          ButtonEvent.status.InWindow:=TRUE
02B4        ELSE
02B8          ButtonEvent.status.InWindow:=FALSE
02C5        ENDIF
02C7
02C8        RUN gfx2("putgc",ButtonEvent.mouse.AcX,ButtonEvent.mouse.AcY

             )
02EB
02EC        END
02EE
02EF
```

**Listing 4:** WhichTool

```
PROCEDURE WhichTool
 0000       (* Procedure to determine which tool
 0024       (* artist wants to draw with
 0040
 0041       TYPE rodent=Vld,Act,ToTm:BYTE; X1:INTEGER; TTTo:BYTE; TSSt:

             INTEGER; CBSA,CBSB,CCtA,CCtB,TTSA,TTSB,TLSA,TLSB:BYTE

             ; X2,BDX,BDY:INTEGER; Stat,Res:BYTE; AcX,AcY,WRX,WRY:

             INTEGER
 00B2
 00B3       TYPE stats=event,InWindow,InToolBox,InMenuBar,line,box,circle

             ,ellipse,bar,arc,fill,text,freehand,patterns,horzlines

             ,vertlines,slantright,slantleft,dots:BOOLEAN
 0106
 0107       TYPE cursor=NoCur,arrow,pencil,cross,hourglass,NoIcon,TextBar

             ,Scross,Icon,IconBuff:BYTE
 0136
 0137       TYPE packet=mouse:rodent; status:stats; pointer:cursor
 0154
 0155       PARAM ButtonEvent:packet
 015E
 015F       IF ButtonEvent.mouse.AcY>10 AND ButtonEvent.mouse.AcY<22 THEN


 017E         ButtonEvent.status.line:=TRUE
 018B         END
 018D       ELSE
 0191         ButtonEvent.status.line:=FALSE
 019E       ENDIF
 01A0
 01A1       IF ButtonEvent.mouse.AcY>22 AND ButtonEvent.mouse.AcY<34 THEN
```

GetKISSMouse, WhichTool and DoEvent are all different from last month. HandleMenu and KISSDrawArc are new. KISSDrawArc is also in an evolutionary state now. It will draw a proper arc if you drag the mouse from the upper-left corner to the lower-right corner. If you drag upward, you'll get three quarters of an ellipse. It took us half a day to figure out how that imaginary limiting line works, and we didn't have time to finish the logic.

The procedures PlayBackPix and RecordPix are just short stubs that print a message on the screen to tell you that the menu handler is working properly. They must be in place when you run HandleMenu, which is every time you click the mouse in the MenuBar at the top of the screen. A note is in order here. If you want to use some of the other "modules," such as KISSDrawCircle or KISSDrawEllipse from last month, you will first need to compare the data structures to those in KISSDrawBox in KISSDrawArc. Then edit the older procedures so the data structures are the same. Otherwise, you will get several error messages.

We still hope that *KISSDraw4* can become a CoCo Community Programming project. If you have a procedure to add, let us know. You may write us directly at 805 West Edmonston Drive, Rockville, MD 20852.

If you're getting into BASIC09, we suggest you read *The Official Basic09 Tour Guide*. It's still available from Bob Rosen at Spectrum Projects, P. O. Box 264, Howard Beach, NY 11414. By the way, Bob has a new backup program that can format and back up up to three copies of double-sided OS-9 Level II disks in one pass, in about five minutes.

That's it for November. Enjoy *KISSDraw4* while we think about the holiday issue. ☐

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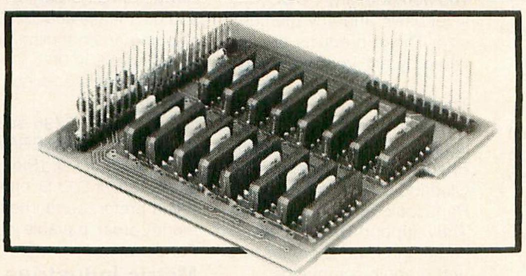

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```
01C0      ButtonEvent.status.box:=TRUE
01CD      END
01CF    ELSE
01D3      ButtonEvent.status.box:=FALSE
01E0    ENDIF
01E2
01E3    IF ButtonEvent.mouse.AcY>34 AND ButtonEvent.mouse.AcY<46 THEN

0202      ButtonEvent.status.circle:=TRUE
020F      END
0211    ELSE
0215      ButtonEvent.status.circle:=FALSE
0222    ENDIF
0224
0225    IF ButtonEvent.mouse.AcY>46 AND ButtonEvent.mouse.AcY<58 THEN

0244      ButtonEvent.status.ellipse:=TRUE
0251      END
0253    ELSE
0257      ButtonEvent.status.ellipse:=FALSE
0264    ENDIF
0266
0267    IF ButtonEvent.mouse.AcY>58 AND ButtonEvent.mouse.AcY<70 THEN

0286      ButtonEvent.status.bar:=TRUE
0293      END
0295    ELSE
0299      ButtonEvent.status.bar:=FALSE
02A6    ENDIF
02A8
02A9    IF ButtonEvent.mouse.AcY>70 AND ButtonEvent.mouse.AcY<82 THEN

02C8      ButtonEvent.status.arc:=TRUE
02D5      END
02D7    ELSE
02DB      ButtonEvent.status.arc:=FALSE
02E8    ENDIF
02EA
02EB    IF ButtonEvent.mouse.AcY>82 AND ButtonEvent.mouse.AcY<94 THEN

030A      ButtonEvent.status.fill:=TRUE
0317      END
0319    ELSE
031D      ButtonEvent.status.fill:=FALSE
032A    ENDIF
032C
032D    IF ButtonEvent.mouse.AcY>94 AND ButtonEvent.mouse.AcY<106 THEN

034C      ButtonEvent.status.text:=TRUE
0359      END
035B    ELSE
035F      ButtonEvent.status.text:=FALSE
036C    ENDIF
036E
036F    IF ButtonEvent.mouse.AcY>106 AND ButtonEvent.mouse.AcY<118 THEN

038E      ButtonEvent.status.freehand:=TRUE
039B      END
039D    ELSE
03A1      ButtonEvent.status.freehand:=FALSE
03AE    ENDIF
03B0    END
03B2
```

**Listing 5:** `DoEvent`

```
PROCEDURE DoEvent
0000      (* Procedure that runs the proper tool program
002E
002F      TYPE rodent=Vld,Act,ToTm:BYTE; X1:INTEGER; TTTo:BYTE; TSSt:

           INTEGER; CBSA,CBSB,CCtA,CCtB,TTSA,TTSB,TLSA,TLSB:BYTE

           ; X2,BDX,BDY:INTEGER; Stat,Res:BYTE; AcX,AcY,WRX,WRY:

           INTEGER
00A0
00A1      TYPE stats=event,InWindow,InToolBox,InMenuBar,line,box,circle

           ,ellipse,bar,arc,fill,text,freehand,patterns,horzlines

           ,vertlines,slantright,slantleft,dots:BOOLEAN
00F4
00F5      TYPE cursor=NoCur,arrow,pencil,cross,hourglass,NoIcon,TextBar

           ,Scross,Icon,IconBuff:BYTE
0124
0125      TYPE packet=mouse:rodent; status:stats; pointer:cursor
0142
```

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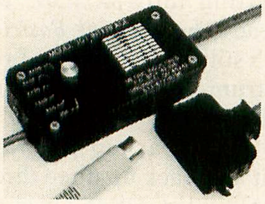

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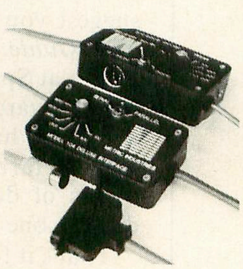

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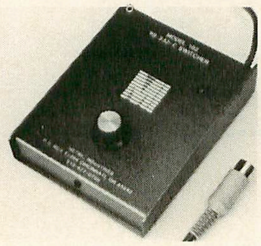

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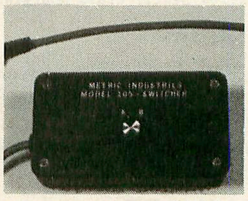

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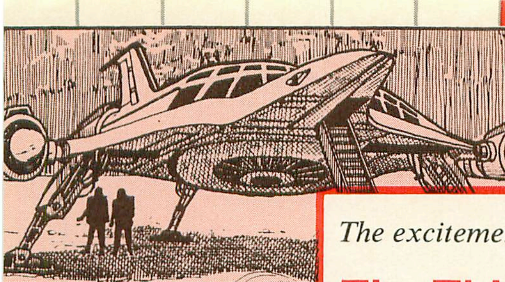

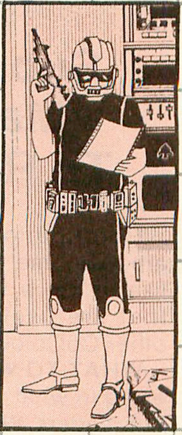

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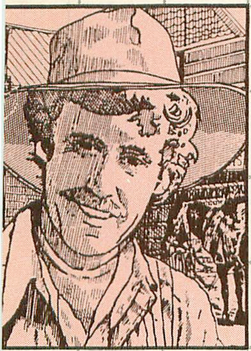

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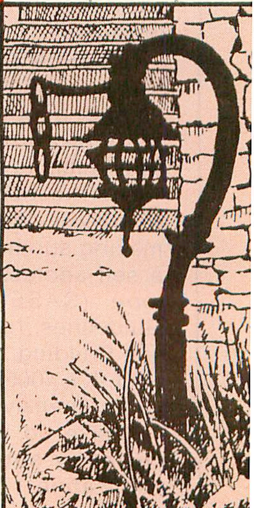

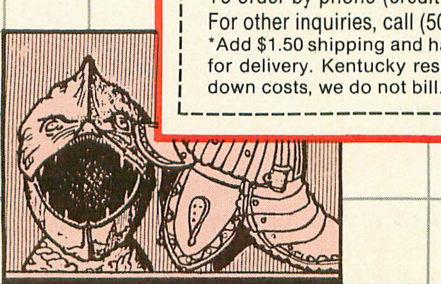

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Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs that are useful/helpful/fun for other CoCo owners.

**WHAT TO WRITE:** We are interested in what you may wish to tell our readers. We accept for consideration anything that is well-written and has a practical application for the Tandy Color Computer. If it interests you, it will probably interest lots of others. However, we vastly prefer articles with accompanying programs which can be entered and run. The more unique the idea, the more the appeal. We have a continuing need for short articles with short listings. These are especially appealing to our many beginners.

**FORMAT:** Program submissions must be on tape or disk, and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs and debug our typing errors. All programs should be supported by some editorial commentary explaining how the program works. We also prefer that editorial copy be included on the tape or disk using any of the word processors currently available for the Color Computer. Also, please include a double-spaced printout of your editorial material and program listing. Do not send text in all capital letters; use upper- and lowercase.

**COMPENSATION:** We do pay for submissions, based on a number of criteria. Those wishing renumeration should *so state* when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a self-addressed, stamped envelope (SASE) to: Submission Guidelines, THE RAINBOW, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. We will send you comprehensive guidelines.

Please do not submit material currently submitted to another publication.

```
0143        PARAM ButtonEvent:packet
014C
014D        IF ButtonEvent.status.line THEN
015C          RUN KISSdrawline(ButtonEvent)
0166          ButtonEvent.status.line:=FALSE
0173          GOTO 100
0177        ENDIF
0179
017A        IF ButtonEvent.status.box THEN
0189          RUN KISSDrawbox(ButtonEvent)
0193          ButtonEvent.status.box:=FALSE
01A0          GOTO 100
01A4        ENDIF
01A6
01A7        IF ButtonEvent.status.circle THEN
01B6          RUN KISSDrawCircle(ButtonEvent)
01C0          ButtonEvent.status.circle:=FALSE
01CD          GOTO 100
01D1        ENDIF
01D3
01D4        IF ButtonEvent.status.ellipse THEN
01E3          RUN KISSDrawEllipse(ButtonEvent)
01ED          ButtonEvent.status.ellipse:=FALSE
01FA          GOTO 100
01FE        ENDIF
0200
0201        IF ButtonEvent.status.bar THEN
0210          RUN KISSDrawBar(ButtonEvent)
021A          ButtonEvent.status.bar:=FALSE
0227          GOTO 100
022B        ENDIF
022D
022E        IF ButtonEvent.status.arc THEN
023D          RUN KISSDrawArc(ButtonEvent)
0247          ButtonEvent.status.arc:=FALSE
0254          GOTO 100
0258        ENDIF
025A
025B        IF ButtonEvent.status.fill THEN
026A          RUN KISSDrawFill(ButtonEvent)
0274          ButtonEvent.status.fill:=FALSE
0281          GOTO 100
0285        ENDIF
0287
0288        IF ButtonEvent.status.text THEN
0297          RUN KISSHandleText(ButtonEvent)
02A1          ButtonEvent.status.text:=FALSE
02AE          GOTO 100
02B2        ENDIF
02B4
02B5        IF ButtonEvent.status.freehand THEN
02C4          RUN KISSFreehand(ButtonEvent)
02CE          ButtonEvent.status.freehand:=FALSE
02DB        ENDIF
02DD
02DE 100    ButtonEvent.status.event:=FALSE
02EE        ButtonEvent.status.InToolBox:=FALSE
02FB        ButtonEvent.status.InMenuBar:=FALSE
0308        END
030A
030B
```

**Listing 6:** `HandleMenu`

```
PROCEDURE HandleMenu
 0000
 0001       TYPE rodent=Vld,Act,ToTm:BYTE; X1:INTEGER; TTTo:BYTE; TSSt:

             INTEGER; CBSA,CBSB,CCtA,CCtB,TTSA,TTSB,TLSA,TLSB:BYTE

             ; X2,BDX,BDY:INTEGER; Stat,Res:BYTE; AcX,AcY,WRX,WRY:

             INTEGER
 0072
 0073       TYPE stats=event,InWindow,InToolBox,InMenuBar,line,box,circle

             ,ellipse,bar,arc,fill,text,freehand,patterns,horzlines

             ,vertlines,slantright,slantleft,dots:BOOLEAN
 00C6
 00C7       TYPE cursor=NoCur,arrow,pencil,cross,hourglass,NoIcon,TextBar

             ,Scross,Icon,IconBuff:BYTE
 00F6
 00F7       TYPE packet=mouse:rodent; status:stats; pointer:cursor
 0114
 0115       PARAM ButtonEvent:packet
 011E       DIM Menu(2):STRING[14]
 012F       DIM FileAction:STRING[14]
 013B       DIM MenuCur,Item:INTEGER
 0146
 0147       DATA "RecordPix","PlaybackPix"
 0165
 0166       FOR Item:=1 TO 2
 0176         READ Menu(Item)
 017F       NEXT Item
 018A
 018B       RUN gfx2("OWSet",1,10,0,16,6,0,2)
 01AD       RUN gfx2("boldsw","on")
```

```
01C0        RUN gfx2("CurXY",0,0)
01D3        PRINT "F I L E      "
01E3        RUN gfx2("boldsw","off")
01F7
01F8        LOOP
01FA
01FB          (* Exit and close window if Button Down outside of Menu Window
0239        EXITIF ButtonEvent.mouse.Stat=2 AND ButtonEvent.mouse.CBSA<>0

             THEN
0258          RUN gfx2("owend")
0265        ENDEXIT
0269
026A          (* Exit, close menu window and run File Menu Action requested if
02AA          (* Mouse is in menu window, button is down and menu item selected
02EB          (* is valid.
02F7
02F8        EXITIF ButtonEvent.mouse.Stat=0 AND ButtonEvent.mouse.CBSA<>0

             AND MenuCur>0 AND MenuCur<3 THEN
0325          RUN gfx2("owend")
0332          FileAction:=TRIM$(Menu(Item))
033E          RUN FileAction(ButtonEvent)
0348        ENDEXIT
034C
034D          RUN getKISSMouse(ButtonEvent)
0357          MenuCur:=INT(ButtonEvent.mouse.AcY/8)
036A          Item:=MenuCur
0372          IF ButtonEvent.mouse.Stat=0 AND MenuCur>0 AND MenuCur<3 THEN


0392            RUN gfx2("revon")
039F            RUN gfx2("CurXY",1,MenuCur)
03B4            PRINT Menu(Item)
03BC            RUN gfx2("RevOff")
03CA            RUN gfx2("CurXY",1,MenuCur)
03DF            PRINT Menu(Item)
03E7          ENDIF
03E9
03EA        ENDLOOP
03EE        END
03F0
```

**Listing 7:** PlayBackPix

```
PROCEDURE PlayBackPix
 0000       (* Dummy *)
 000B       PRINT "You have reached a Play Back Picture routine.  Write Me!"
 0047       END
 0049
 004A
 004B
```

**Listing 8:** RecordPix

```
PROCEDURE RecordPix
 0000       (* Dummy *)
 000B       PRINT "You have reached Record Pix.  Write me and I'll work"
 0043       END
 0045
```

**Listing 9:** KISSDrawBox

```
PROCEDURE KISSDrawBox
 0000       (* Program to draw a box at location pointed
 002C       (* to by high resolution mouse.
 004B
 004C       (* Uses procedure KISSGetMouse
 006A
 006B       TYPE rodent=Vld,Act,ToTm:BYTE; X1:INTEGER; TTTo:BYTE; TSSt:

             INTEGER; CBSA,CBSB,CCtA,CCtB,TTSA,TTSB,TLSA,TLSB:BYTE

             ; X2,BDX,BDY:INTEGER; Stat,Res:BYTE; AcX,AcY,WRX,WRY:

             INTEGER
 00DC
 00DD       TYPE stats=event,InWindow,InToolBox,InMenuBar,line,box,circle

             ,ellipse,bar,arc,fill,text,freehand,patterns,horzlines

             ,vertlines,slantright,slantleft,dots:BOOLEAN
 0130
 0131       TYPE cursor=NoCur,arrow,pencil,cross,hourglass,NoIcon,TextBar

             ,Scross,Icon,IconBuff:BYTE
 0160
 0161       TYPE packet=mouse:rodent; status:stats; pointer:cursor
 017E
 017F       PARAM ButtonEvent:packet
 0188       DIM StartX,StartY,CurrX,CurrY:INTEGER
 019B
 019C       (* Enable XOR logic
 01B0
 01B1       RUN gfx2("logic","xor")
```

## About The One-Liner Contest . . .

THE RAINBOW's One-Liner Contest has now been expanded to include programs of either one or two lines. This means a new dimension and new opportunity for those who have "really neat" programs that simply just won't fit in one line.

*Here are the guidelines:* The program must work in Extended BASIC, have only one or two line numbers and be entirely self-contained — no loading other programs, no calling ROM routines, no poked-in machine language code. The program has to run when typed in directly (since that's how our readers will use it). Make sure your line, or lines, aren't packed so tightly that the program won't list completely. Finally, any instructions needed should be *very* short.

Send your entry (preferably on cassette or disk) to:

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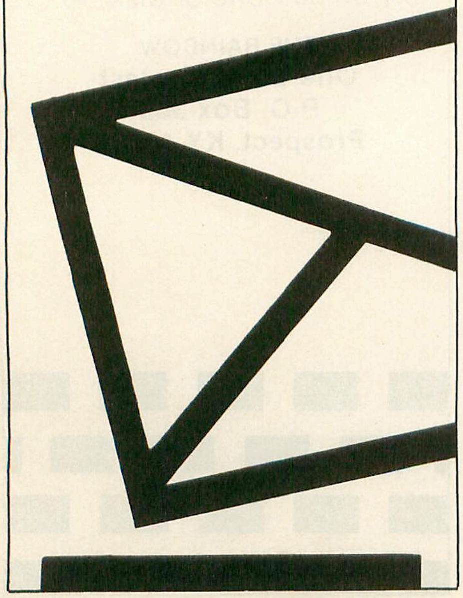

```
 01C4
 01C5        REPEAT
 01C7          RUN getKISSmouse(ButtonEvent)
 01D1        UNTIL ButtonEvent.mouse.CBSA<>0 AND ButtonEvent.mouse.AcX>40
 01EF
 01F0        StartX:=ButtonEvent.mouse.BDX
 01FE        StartY:=ButtonEvent.mouse.BDY
 020C        CurrX:=ButtonEvent.mouse.AcX
 021A        CurrY:=ButtonEvent.mouse.BDY
 0228        RUN gfx2("setdptr",ButtonEvent.mouse.BDX,ButtonEvent.mouse.BDY

              )
 024D
 024E        WHILE ButtonEvent.mouse.CBSA<>0 DO
 0260          RUN getKISSmouse(ButtonEvent)
 026A          IF CurrX<>ButtonEvent.mouse.AcX OR CurrY<>ButtonEvent.mouse.AcY

               THEN
 028B            RUN gfx2("box",CurrX,CurrY)
 02A0            CurrX:=ButtonEvent.mouse.AcX
 02AE            CurrY:=ButtonEvent.mouse.AcY
 02BC            RUN gfx2("box",CurrX,CurrY)
 02D1          ENDIF
 02D3        ENDWHILE
 02D7
 02D8        RUN gfx2("logic","off")
 02EB        RUN gfx2("box",CurrX,CurrY)
 0300
 0301        END
 0303
 0304
```

**Listing 10:** `KISSDrawArc`

```
PROCEDURE KISSDrawArc
 0000        (* Program to Draw Arc with Mouse
 0021
 0022        TYPE rodent=Vld,Act,ToTm:BYTE; X1:INTEGER; TTTo:BYTE; TSSt:

              INTEGER; CBSA,CBSB,CCtA,CCtB,TTSA,TTSB,TLSA,TLSB:BYTE

              ; X2,BDX,BDY:INTEGER; Stat,Res:BYTE; AcX,AcY,WRX,WRY:

              INTEGER
 0093
 0094        TYPE stats=event,InWindow,InToolBox,InMenuBar,line,box,circle

              ,ellipse,bar,arc,fill,text,freehand,patterns,horzlines

              ,vertlines,slantright,slantleft,dots:BOOLEAN
 00E7
 00E8        TYPE cursor=NoCur,arrow,pencil,cross,hourglass,NoIcon,TextBar

              ,Scross,Icon,IconBuff:BYTE
 0117
 0118        TYPE packet=mouse:rodent; status:stats; pointer:cursor
 0135
 0136        PARAM ButtonEvent:packet
 013F        DIM StartX,StartY,CurrX,CurrY:INTEGER
 0152
 0153        (* Enable XOR logic, then
 016C        (* let cursor follow mouse until button is pushed
 019D
 019E        RUN gfx2("logic","xor")
 01B1
 01B2        REPEAT
 01B4          RUN getKISSmouse(ButtonEvent)
 01BE        UNTIL ButtonEvent.mouse.CBSA<>0 AND ButtonEvent.mouse.AcX>40
 01DC
 01DD        StartX:=ButtonEvent.mouse.BDX
 01EB        StartY:=ButtonEvent.mouse.BDY
 01F9        CurrX:=ButtonEvent.mouse.AcX
 0207        CurrY:=ButtonEvent.mouse.AcY
 0215
 0216        WHILE ButtonEvent.mouse.CBSA<>0 DO
 0228          RUN getKISSmouse(ButtonEvent)
 0232          IF CurrX<>ButtonEvent.mouse.AcX OR CurrY<>ButtonEvent.mouse.AcY

               THEN
 0253            RUN gfx2("arc",StartX,StartY+(CurrY-StartY),ABS(CurrX-StartX

                  ),ABS(CurrY-StartY),0,StartY-CurrY,CurrX-StartX,0

                  )
 0297            CurrX:=ButtonEvent.mouse.AcX
 02A5            CurrY:=ButtonEvent.mouse.AcY
 02B3            RUN gfx2("arc",StartX,StartY+(CurrY-StartY),ABS(CurrX-StartX

                  ),ABS(CurrY-StartY),0,StartY-CurrY,CurrX-StartX,0

                  )
 02F7          ENDIF
 02F9        ENDWHILE
 02FD
 02FE        RUN gfx2("logic","off")
 0311        RUN gfx2("arc",StartX,StartY+(CurrY-StartY),ABS(CurrX-StartX

              ),ABS(CurrY-StartY),0,StartY-CurrY,CurrX-StartX,0)
 0355
 0356        END
 0358
```

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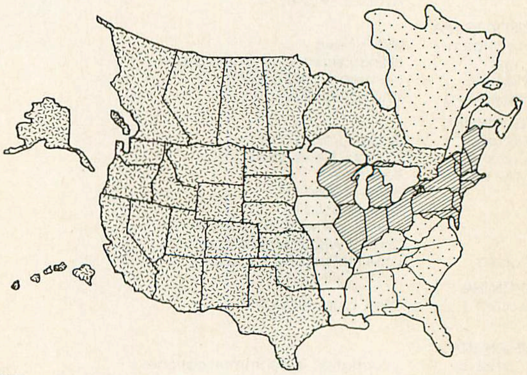

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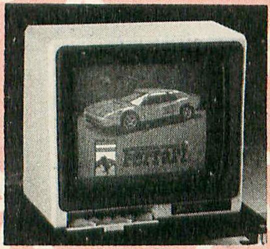

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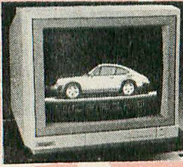

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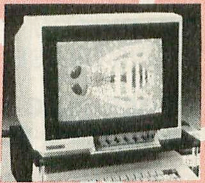

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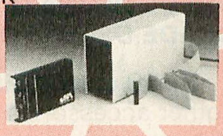

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**360K**

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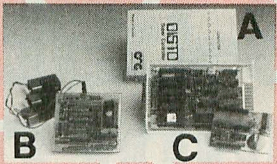

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**$98** DC-3 **A**
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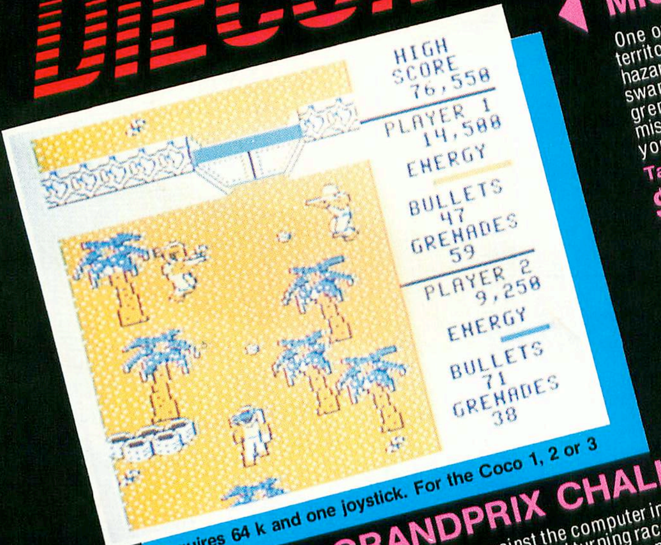

Requires 64 k and one joystick. For the Coco 1, 2 or 3

## GRANDPRIX CHALLENGE

Race alone against the computer, or with a friend against the computer in this high speed racing game. You compete in 5 lap races around twisting and turning race courses. Finish the race ahead of all the computer cars and you will progress to a more challenging course. Collect repair tools as you race around the track and you will be able to increase the speed and handling of your race car. But watch out for oil slicks and water puddles on the track or you might find your car crashing into a wall. Detailed 320 × 200 graphics and realistic driving conditions make this a must for your Coco 3 collection. Many different race tracks will keep you challenged.

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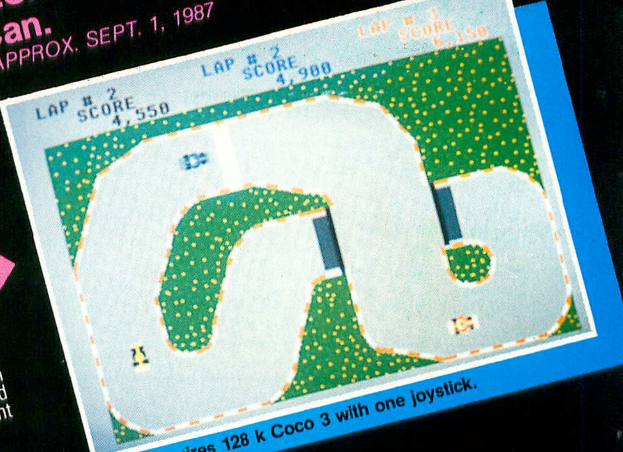

Requires 128 k Coco 3 with one joystick.

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It's back and better than ever. It's Gantelet II for your Coco 3. Using 320 × 200 hi-res graphics with 16 colors, we have created one of the best arcade style games you will ever see for your Coco. Four people can now play simultaneously in one game. Dozens of new levels with new monsters will challenge even the best players. Collect keys to open doors and chests, treasures, and many new magic potions to help you battle more powerful monsters. Watch out for hidden traps as you search for the exit to next level.

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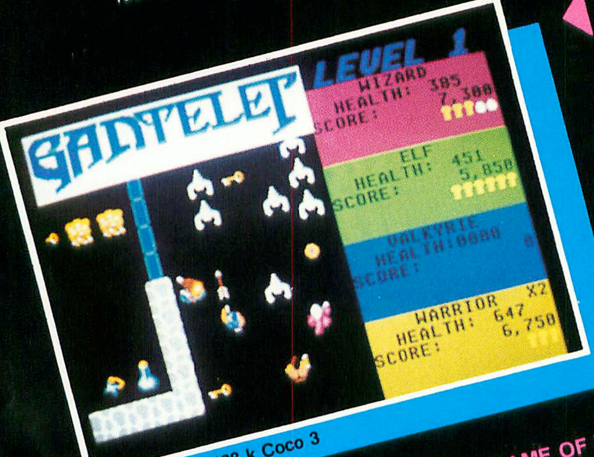
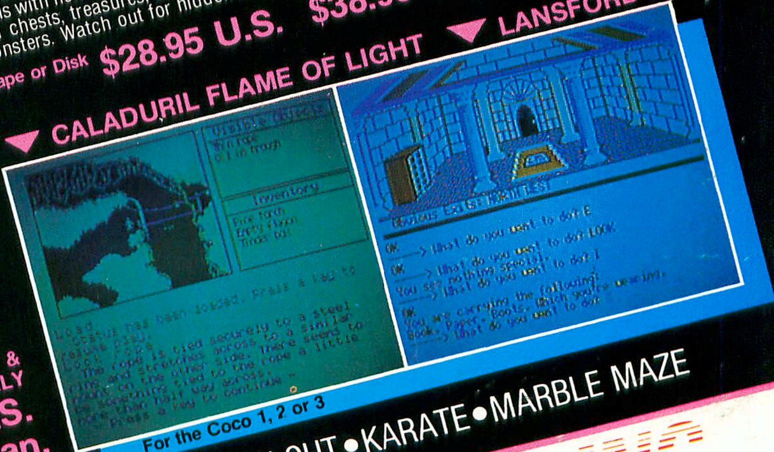


Requires 128 k Coco 3

## CALADURIL FLAME OF LIGHT

## LANSFORD MANSION



For the Coco 1, 2 or 3

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# New! from DR. PREBLE'S PROGRAMS

## Introducing PYRAMIX

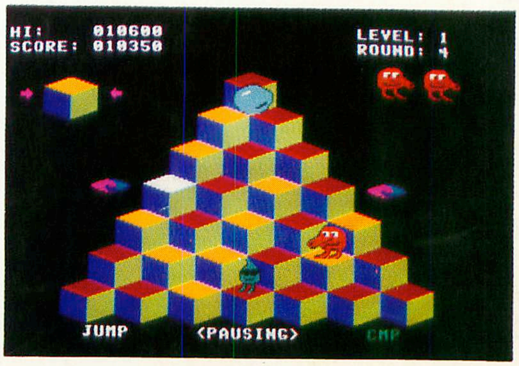
### For your Color Computer 3 !

Product of ColorVenture

**PYRAMIX** is a 100% machine language game written exclusively to take advantage of all the power in your 128K CoCo 3. The colors are brilliant, the graphics sharp, the action hot.

**PYRAMIX** features the finest in animation, graphics, sound effects and game play available today. It has all the extras you want, too, such as a pause option, RGB and CMP modes, keyboard or joystick play, help screen, multiple skill level, and the ability to backup your disk.

Best of all is the low price! Available today, for only **$24.95 on disk + s/h!**



### . . . And Lightning Strikes!

**LIGHTNING RAM DISK** is the most versatile RAM disk for your **512K** Color Computer 3! LIGHTNING RAM DISK will allow you to use up to 4 mechanical drives and 2 RAM drives simultaneously for a total of 6 Drives! This RAM DISK will also work simultaneously with our amazing LIGHTNING PRINTER SPOOLER! **$19.95 on disk + s/h.**

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## Dr. Preble's Prescriptions...

Basic Freedom

Mental Freedom

**BASIC FREEDOM!** No one wants to be chained down. And yet, if you type in BASIC programs, you have been subject to involuntary servitude! The culprit? BASIC's limited EDIT command.

**Demand Your BASIC FREEDOM!** Programmed by Chris BabCock for ColorVenture, this software gives you a **full screen editor** for typing in and editing BASIC programs! Move the cursor anywhere on the screen. Insert, delete or add text. It's the same concept as in a word processor, except you never have to leave BASIC! BASIC FREEDOM is an invisible machine language program which you can turn on and off at will. Even pressing RESET will not hurt your BASIC FREEDOOM! Simple, yet powerful with an easy to read manual. Many extra "nice touches" included, like KEY REPEAT and LOWERCASE INTERPRETER which lets you type BASIC commands in upper or lower case for ease of programming. Translation to uppercase is automatic for commands. Text in quotes is not affected.

For CoCo 1, 2, or 3!

**SPECIAL COCO 3 VERSION** lets you work in 32, 40, or 80 column display modes. A separate version is available for the CoCo 1 and 2. Available on disk for $24.95 + s/h.

**MENTAL FREEDOM** by Dr. Preble! IMAGINE! Some day, a computer so advanced that it responds to your very thoughts and emotions. Imagine, some day, **thought-controlled** graphics: levitation and materialization! **PLUG IN YOUR MIND and UNHOOK YOUR JOYSTICKS**--that day is now! The Radio Shack Color Computer has many advanced capabilities, just waiting to be tapped. Dr. Preble's Programs combines the advanced technology of the CoCo with the amazing **Radio Shack Biofeedback Monitor** to bring you **"Mental Freedom."**

For CoCo 2 or 3

**THOUGHT-CONTROLLED VIDEO CHALLENGE?** Unlike any video game you have ever played, our Thoughtware tests your ability to handle stress, to remain calm under adverse circumstances. **LIGHTNING FAST** reflexes will do you no good here, unless you first tame the fickle dragon of your mind. **Are you the secretely nervous type?** Many people can keep a "Poker Face" even when they are worried so that others may not notice; but can you really stop the worry itself? Find out with **Mental Freedom!**

**AND IT TALKS!** Did you know that the CoCo can produce incredibly realistic digital speech without a special speech synthesizer? The voice quality is so good, it sounds human! Honest. Best of all, no extra hardware is needed for speech, just some clever programming by Dr. Preble.

**MENTAL FREEDOM** - Next time your friends ask what your computer can do, show them **Dr Preble's Thoughtware!** Requires Radio Shack's Biofeedback Monitor Catalogue #63-675. **Mental Freedom** - DISK only $24.95 + s/h

### CoCoBraille

⠠⠉⠕⠠⠉⠕⠠⠃⠗⠇

Emboss Grade 1 or Grade 2 Braille using your CoCo 1, 2 or 3 and a Brother Daisy Wheel printer! Fast Print to Braille conversion algorithm converts word processor files, program listings and data files into **touch readable Braille.** For use by the blind or the sighted. **No knowledge of the Braille code is necessary.** Just send print to the program and out comes Braille! Note: The complex Grade 2 conversion is very good and though not always perfect, quite readable. Requires 64K or more. Brother HR series printer or the IF-50 interface series required. Low Cost! Similar software costs 3 times as much. Only $95.

### Disk Directory Dazzler

Dress up your Disk Directory with colorful messages and borders. Create useful help messages. Add that professional touch to your creations! Only $9.95

**VDOS, the UnDISK:** Save multiple programs in memory. Or save multiple graphic pictures in memory. Works with or without a disk. Let's you SAVE, LOAD and KILL stored programs or graphics. DIRECTORY function lists files, gives the start, end and execution addresses of machine language programs and number of free bytes remaining. Own a RAM disk without buying a disk drive! Requires 64K CoCo 1 or 2. Available on tape or disk for $24.95 + shipping/handling.

**VDUMP, for the UnDISK:** Backup all your UnDISK files to a single tape file for easy reloading A must for VDOS users! On tape for $14.95 + shipping/handling.

**VPRINT, for the UnDISK:** Paper printout for UnDISK Directory. On tape, $9.95 + shipping/handling.

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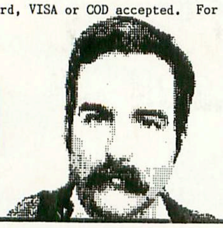

For CoCo 1 or 2

CoCo Programs T.I.D.

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